THE

DENTAL COSMOS:

A

MONTHLY RECORD OF DENTAL SCIENCE.

Devoted to the Interests of the Profession.

EDITED BY

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Observe, Compare, Reflect, Record.

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THE

DENTAL COSMOS.

NEW SERIES.

Vol. V. PHILADELPHIA, AUGUST, 1863. No. 1.

ORIGINAL COMMUNICATIONS.

PRACTICAL HINTS.

BY J. D. WHITE.

Concussion of Front Teeth.—It is not unfrequent that the front teeth are injured by blows so as to call into exercise the mature and deliberate judgment of the dentist. It generally occurs to young persons, yet this is not always true. If one of those teeth is broken, it is not unfrequent that dentists advise its extraction; this involves considerations which we do not intend to mingle in this article; we wish to go directly to the consideration of the subject upon the injuries sustained by the *concussion* of those teeth without actual fracture. We frequently see teeth which are quite blue or much discolored, and yet not decayed; they have lost their vitality, however, and often the patient cannot inform us at what time they became so. The teeth, of course, have lost the vitality of their pulps, and, receiving no attention, became discolored. How many of those cases might have been prevented, we have no means of knowing; but when recent cases occur to us, we do know the treatment; it is this we wish to impress upon the mind, at least, of the young reader. We are led to the consideration of the subject, because cases are occurring and coming under our observation, and dentists either did not fully appreciate them, or lacked the nerve to act in conformity with their better judgment.

Case 1.—A lady, nearly thirty years of age, had the misfortune to fall in the street on the ice, and strike her mouth against a bank of snow and ice, severely cutting and bruising the lips and gum over the front teeth. There was no fracture of the teeth; the parts were sore, and the left front incisor somewhat loose and painful. Her teeth were prominent and handsome, and merely by way of precaution, she called to consult us. We remarked to her that the blow had stunned the pulp, and it was highly congested, and the proper treatment was to drill the tooth on the posterior surface, and treat the case

as if it were an exposed pulp by decay. This shocked her and her friends very much, as that would surely entail a blue tooth. We contended that letting it take its course would much aggravate it. Placing the patient in a strong light, and a mouth mirror on the back part of the tooth, a slightly reddened condition in the centre of the tooth was observable. This was not sufficient to allow the patient or the friends to submit to so ultra an operation as drilling and destroying the pulp; it was sufficient for us to be governed by, as we never knew of a case of the kind to recover. In a few days the tooth assumed a very red appearance all through the crown, and if it were to remain so, it in itself would be unsightly. At this point it was conceded that we should do whatever we saw fit. We drilled the tooth as suggested above; as soon as the tooth was perforated, it bled quite freely; the orifice was left open for about three days, when, to the joy of the patient, the tooth assumed a natural hue. Then, upon examination, the pulp was not entirely dead—the balance was destroyed with the arsenical paste. The tooth bled for about three weeks; the blood was mopped out of the tooth with cotton and water, on a probe, every two days. The prolonged bleeding was doubtless caused by the bruised condition of the parts generally. Leeches were applied to the gums twice during the treatment of the tooth. When the parts were sufficiently recovered, we cut out the crown of the tooth toward the cutting edge, to get rid of the *pathy* portion which we have often spoken of before in front teeth; also to facilitate a more thorough plugging. Two years and a half have elapsed, and the tooth still retains a normal hue. Three or four times since, however, the gum has become congested, when leeching has been resorted to, which afforded immediate relief.

This case is important and valuable in many aspects to practitioners as well as in dental pathology. We will give another case in our next.

(To be continued.)

OBSERVATIONS ON PATHOLOGY, IN ITS RELATIONS TO DENTAL IRRITATION, DEDUCED FROM REPORTS AND OBSERVATIONS OF MANY CASES.

BY ABR. ROBERTSON, D.D.S., M.D.

(Concluded.)

Insanity is sometimes caused by Diseased Teeth.—Copeland's Medical Dictionary, vol. ii. p. 568, says: "Whatever greatly exhausts organic nervous power, both predisposes to and directly occasions insanity."

Dr. Rush, "Medical Inquiries and Observations," p. 33, says: "Insanity has been brought on in one instance, by diseased teeth, which were not accompanied with pain."

James Trudeau, M.D., of Paris, says: "M. Esquirol told me that he

had cured a young lady, who was insane, of her mania by the extraction of her second molar tooth, which was preventing the growth of a wisdom tooth."

For a report of an interesting case of this kind, see DENTAL COSMOS for October, 1861, p. 156.

Epilepsy from Diseased Teeth.—Marshall Hall, in his "Clinical Notes on Epilepsy," enumerates dental irritation among the causes of this disease. (Vide *Lancet* for 1853.)

Sir Charles Locock, President of the Medical and Chirurgical Society of London, in a discussion before that society, (see *London Lancet*, vol. ii. p. 138, for 1857,) places dentition as a very common cause of epilepsy, and says "he has certainly seen the affection cured in more than one instance by the extraction of teeth."

Dr. Bennet ("Tweedie's System of Practical Medicine," pp. 537, 538) enumerates difficult or painful dentition among the causes of this disease.

Dr. Bell ("Stokes and Bell's Practice of Medicine," p. 571) says: "Epilepsy is brought on by causes which either unduly excite or greatly enfeeble the nervous system and the brain generally." That dental irritation produces these effects, both indirectly and directly, we have already shown. It is but reasonable, therefore, to suppose that it may sometimes be the cause of this disease; and the authorities already quoted, and some others to be quoted, and sustained by cases, most evidently prove that it sometimes is.

In an analysis of fifty-two cases of epilepsy presented to the Royal Medical and Chirurgical Society of London, by E. H. Sieveking, M.D., he was able to trace the exciting cause in thirty-seven; and of these, two he states to have been from dentition. (See *Lancet* for May, 1855.)

Dr. Rush ("Med. Inq. and Obs.") says: "Some time in the year 1801, I was consulted by the father of a young gentleman in Baltimore, who had been afflicted with epilepsy. I inquired into the state of his teeth, and was informed that several of them in his upper jaw were much decayed. I directed them to be extracted, and advised him afterward to lose a few ounces of blood at any time that he felt the premonitory symptoms of a recurrence of his fits. He followed my advice, in consequence of which I had lately the pleasure of hearing, from his brother, that he was perfectly cured."

For another case of epilepsy cured by the extraction of diseased teeth, see DENTAL COSMOS for October, 1861, p. 157, Case 6.

Paralysis from Dental Irritation.—The *American Journal of Dental Science*, New Series, vol. i. p. 504, quotes from the *London Lancet*, as reported by J. L. Levison, of Brighton, the following case: "Miss ——, a young lady, was brought in a carriage to my residence, to have her mouth examined. On being removed, she was supported by a lady on one side, and a man-servant on the other, and her entire muscular

system seemed paralyzed. Her legs trailed on the ground like useless appendages; her arms, when raised, fell powerless, immediately, when unsupported; and even the muscles of the tongue were paralyzed, and in her efforts to speak, this important organ remained in a quiescent state. On examining the mouth, I perceived a *dens sapientia* of the lower jaw very carious, and deeply imbedded in the temporal muscle, just below the ridge of the coronoid process, in which locality there was extensive inflammation. I suggested the removal of the tooth; and though I had anticipated some advantage from the operation, the actual result astonished me. She instantly obtained the free use of her tongue, which she immediately used to communicate an important fact, viz., that ever since the tooth I had extracted had been making its way through the gum, she could date the gradual loss of power over her limbs, etc. I saw her about a month afterward; she could then use her hand and arm—she was writing a letter! Since then I have not heard what progress she has made."

The *Dental News Letter* for April, 1859, p. 229, quotes a very interesting case of this kind from the *British Medical Journal* for June, 1858, as related by Mr. Clendenin, Surgeon-Dentist to the Westminster Hospital; but it is, perhaps, too long for your crowded pages. I therefore only refer to it. For another case of paralysis of the arm, see DENTAL COSMOS for October, 1861, p. 157. Two of the cases also reported in one of my former numbers, under the head of Neuralgia, might with equal propriety have been placed under this head, as paralysis accompanied them both.

Sir Astley Cooper, in speaking of the effects of slight irritation, ("Lectures on Surgery," vol. i. p. 10,) says: "M. Toulmin, of Hackney, attended a lady on account of her suffering unusually from a diseased tooth; and she appeared to be afflicted with hemiplegia. M. Toulmin extracted the tooth, and in a short time the paralytic affection entirely subsided."

There are some other cases of paralysis occurring from dental irritation on record, to which I *may* refer more particularly in some future paper treating on some of the lesions attending the coming of the wisdom teeth, and therefore omit them here.

Catalepsy from Toothache.—The *Dental Recorder*, vol. viii. No. 1, p. 197, (1854,) quotes from *The Stethoscope*, as reported by Dr. Huton, the following case:—

"Willis, a plowboy, (October last) was complaining of toothache early in the morning; half an hour after commencing work, was observed lying a short distance from the plow apparently dead. He was carried to the house, nearly a mile, and the doctor (five miles distant) sent for. In the belief that the effect might be produced through the dental nerve, the tooth was extracted, when the boy immediately got up and expressed

himself as well as ever; and has continued well since. He had been an unusually healthy boy, and had never had a physician to see him before."

Chorea is sometimes caused by Dental Irritation.—Alexander Tweedie, M.D., F.R.S., ("System of Practical Medicine," vol. ii. p. 45,) says: "The disease (chorea) is occasionally induced by the irritation accompanying second dentition." And further on (same page) he says: "All the causes of constitutional debility, whether constitutional or acquired, are favorable to the production of chorea."

We have abundantly shown already, that diseased teeth and other dental irritations are the causes of much constitutional debility.

Dr. West ("Lectures on the Diseases of Infancy and Chilhood," p. 36) says: "Sometimes chorea seems to be connected with some irregularity in the progress of the second dentition."

The American Journal of Dental Science, vol. vi. New Series, p. 146, quotes from the *Dental News Letter* the following

Case.—"Dr. Billard says, after an examination of the case, which was one of what is commonly called St. Vitus' dance, that he found several stumps in both jaws, the gums entirely covering some of them, and on pressure of the same, it caused her great pain, and pus exuded on the slightest pressure. * * * * * I proceeded to give ether, and it took a double quantity to make her insensible to pain. I then took out eight stumps and some small pieces of dead alveoli, which had caused a continuous irritation of the parts. Since that time, the author states, the paroxysms grew less frequent, and now the patient, Miss L., enjoys her usual health."

Erysipelas from a Diseased Tooth—Death of Patient.—The following case was reported by Dr. Thompson of the "Seaman's Retreat," (N. Y.,) and furnished to the *New York Medical Gazette*, in which it was published, vol. iii. p. 263, (1852,) by Dr. Sayer of that city.

Case.—"Charles Lunt, aged thirty, Swede, arrived June 28 from Havre. Admitted into hospital at the date just mentioned for an inflammatory tumefaction of left cheek and parotid gland, of three days' standing, as patient stated, from toothache, with which he had been annoyed for several days previous to the swollen face. Patient otherwise healthy and of a stout robust appearance.

"On admission, the tooth of which he complained was extracted; there discharged, in cutting about the tooth, a considerable quantity of fetid pus. After extraction of the tooth, a powder of calomel and rhei was given, and an emollient poultice applied to the face. The latter was continued, and antiphlogistic remedies pursued, but without much relief to the pain or reduction of the swelling—when, after several days, the inflammation assumed an erysipelatous character. The affected parts were now painted with a strong solution of nitrate of silver, evaporating lotions applied, and the remedies indicated by the constitutional symptoms ad-

ministered internally. This treatment persisted in, the inflammation, in a short time, greatly subsided, and these promised hopes of a speedy recovery. Suddenly, however, the erysipelas commenced to spread, and the accompanying symptoms to increase in violence, until the palpebra of the (left) eye and parts adjacent became involved. As the disease advanced, pus was formed in several places, which was evacuated. The conjunctiva, partaking of the contiguous inflammation, became swollen and edematous. The other tissues of the eye also soon became involved, and now occurred delirium and other symptoms indicative of the extension of the inflammation to the brain. This being apprehended, a vigorous revulsive antiphlogistic course of treatment was adopted, but without much relief to the patient. The symptoms just alluded to continuing, and gradually increasing in violence, the disease on the fourth day of their occurrence proved fatal."

Vicarious Menstruation from Decayed Teeth.—Dr. Rush, "Med. Obs. and Inqrs.," says, in the second number of a work entitled "Bibliotheque Germanique Medico-Chirurgicale," published in Paris by Dr. Bluver and Dr. Delaroche, there is an account published by Dr. Siebold of a young woman who had been affected for several months with great inflammation, pain, and ulcers in her right upper and lower jaws, at the usual time of the appearance of the catamenia, which at that period were always deficient in quantity. Upon inspecting the seats of these morbid affections the doctor discovered several of the molars in both jaws to be decayed. He directed them to be drawn, in consequence of which the woman was relieved of the monthly disease in her mouth, and afterward had a regular discharge of her catamenia.

In the *Western Journal of Medical and Physical Science* for 1838, Dr. S. P. Hulliben reported the following

Case.—"Some time since a young lady about seventeen years of age applied to me with a fungus growth in each of the second molars of the lower jaw, which had assumed rather a novel character. She stated that the fungi had made their appearance in both teeth at the same time, about four years before, and that for the last two years she had been much troubled with a bleeding from them, which took place regularly once a month, and continued several days. She being very anxious to have the teeth saved, I destroyed, to all appearance, the morbid growth, and plugged the teeth. In a few days they became sore and painful, the plugs were removed, and a slight bleeding commenced, which continued three or four days, and then the tumors entirely disappeared. I was, therefore, induced to plug them again; but in about three weeks the teeth became sore, the plugs were removed, and a bleeding ensued as before. I now suspected it to be a vicarious menstruation, and mentioned the case to the family physician. At his request I plugged them again, and the result was precisely as before. The teeth were then removed,

and the patient was put under a course of treatment by her physician which effected a cure."

As somewhat allied to this I will here venture the opinion, although I have no case in mind by which to illustrate the fact, that other uterine diseases are often greatly aggravated, if not induced, by this same cause. And, improbable as it may at first seem, especially do I believe this to be true in relation to one of the most common afflictions—a very severe affliction, too—of the females of our country, prolapsus of the uterus.

This much at least is certain, general debility, however induced, is a most common cause of this complaint, and I have often observed that when it is not complicated with other diseases, as inflammation, ulceration, etc., it may readily be cured, often by topical applications only, or by topical applications in conjunction with tonics and healthful exercise in the open air, and sometimes by the tonics and exercise without any topical treatment, or perhaps by Dr. Meigs' cure alone, of "six miles walk a day, commencing with small doses, and increasing according to ability;" but if from any cause the general health afterward suffers, and debility ensues, a recurrence of the prolapsus will also be likely to ensue. And since diseased teeth, by the nervous irritation they produce, by the derangement they cause in the digestive and respiratory organs, are most common and potent cause of such debility, they must necessarily be the cause, indirectly at least, of this kind of suffering.

I have now, perhaps, said enough to demonstrate the fact that dental irritation is the direct cause of many serious diseases, that it is the indirect cause of many, and that it greatly aggravates many others. This is all that I proposed to do.

ADVANTAGES OF ASSOCIATED LABOR.

BY DR. S. B. PALMER.

Read at the First Regular Meeting of the Central New York Dental Association, held in Auburn, May 12th, 1863.

As a result of perseverance, much labor, and a number of preliminary meetings, we are to-day assembled in the capacity of a Dental Association in Central New York, and yet all that has been accomplished thus far is but an experiment. Will the experiment succeed, and we, as dentists, derive the benefit of associated labor and social intercourse, or fail and blast the bright hopes now before us, and thereby assign to each his accustomed routine of labor to still go on plodding round and round in the same selfish circle, is a matter of time, which the future alone can reveal. In either case, the effort will not be unlike others that have preceded us.

On one hand we have but the record left of a like organization; on the other, a living and promising association.

Perhaps the only distinction to be made between this and former meetings of this society consists in appointing the present, the first regular meeting of the association.

When years shall have passed, we may revert to this day and its transactions with disappointment and regret, or with satisfaction and pleasure, as on similar occasions we meet to refresh and improve our minds professionally, or to gladden and cheer our hearts socially.

The ultimate success of this enterprise depends wholly upon individual effort, to sustain and make each meeting interesting and instructive.

Let us as far as possible carry out the sentiment of that article in our constitution which says—"The object of this association shall be for the mutual improvement and professional intercourse of its members."

Dentistry arose from a position akin to the occupation of the common barber, and is now one of the learned professions of the present day.

How has this rapid change been accomplished?

Not by selfishly hoarding up for individual promotion all new and useful discoveries.

The early history of the science marks the improvement under such influences, and its growth appears much like some kind of timber found growing in tropical climates, whose annular rings can hardly be traced.

By the establishing of dental colleges, dental periodicals, and dental associations, we behold progress in the science of dentistry in America, unequaled by any other nation or people.

The present, how unlike the past, when the dental student could be regarded as one in pursuit of knowledge under difficulties! The "no admittance" card greeted him at the door of nearly every laboratory; and for the detached portions of the science and art then in market, be compelled to pay a price as extravagant as the knowledge was secret.

But thanks to the pioneers and the liberal-minded of the profession! They have left for us a rich legacy of discovery, experiment, and experience. True, many of the earlier modes of manipulating have been superseded by modern discoveries; and the liberal exchange of ideas conveyed through the various periodicals devoted to the science have rendered the means of acquiring a thorough knowledge of dentistry comparatively easy. Do all who claim the title of dentist, forget such knowledge?

With all the facilities afforded for instruction, we see a vast difference in the various operations performed by different members of the profession. Why this difference? and why so many inferior operations?

Perhaps a lack of knowledge and skill to operate correctly; perhaps for want of proper designs or patterns to imitate, or intimation that others could do even better.

In a science like dentistry, which embraces various divisions of both the mechanics and the arts, the mind has opportunity, and very naturally seeks

and finds its affinity in some one division more than another, and as minds vary as well as subjects, no department is likely to escape special attention.

One of the advantages of association consists in bringing together the result of those special labors and experiences in the several departments, which, compiled, make one whole record of the knowledge thus obtained for the benefit of each and all.

Mankind are but creatures of imitation, and the so-called "genius but an example of unyielding perseverance."

How important then that we have the best designs and examples given us for imitation!

Although at first we may not be able to command that degree of instructive talent of which older societies can boast, yet we may make this a nucleus around which to rally, a recruiting station where we may enroll our names as volunteers for professional improvement and public service.

The subject treated at our last meeting was convincing to all that dentists have pecuniary claims upon their patients; let us in charity acknowledge that our patients also have *equivalent* claims upon us.

Mere titles amount to nothing, and the advertisements of the empiric so far exceed those of the unpretending proficient practitioner, that even a meritorious discovery or improvement announced by the latter, if in advance of the usual adopted modes of treatment, is looked upon with skepticism and distrust.

The sign of "Dentist" placed at the entrance of an office should be a sufficient guarantee to the unfortunate in search of professional aid, that they might expect the services of one skilled and experienced in the dental art. Does that title or one even more highly qualified give any such assurance?

Could we see a graduated scale on which was marked the various degrees of dental talent, it would exceed in length the scale of a Fahrenheit thermometer.

In the practice of medicine, all are doctors, from the most eminent and skillful down to those whose highest attainment would only admit of prescribing catnip tea to a restless infant, or recommend carrying in the pocket a small swine bone, as an infallible cure for rheumatism.

So in our profession, all are dentists, from those possessing the highest degree of worth and talent to those whose lack of skill compels them to deal in plastic materials, and whose proficiency is mainly manifested in extracting—unjust fees from their patients' pockets.

Gentlemen, we do not expect to correct all those evils, but let us unite in drawing a line of distinction between the worthy and unworthy, the skillful and the empiric.

Are not dentists themselves responsible for many of the existing difficulties? Have we not measured the blocks which we have fitted to take

place in the great dental monument, by a rule too short? Are we sure that they may be placed in the structure without the sound of a hammer? Let us compare our rules with the universal standard, and when in harmony with them, then will they agree with each other. Let us say to the aspirant in search of a lucrative employment, who is desirous of learning "the dentists' trade" in one year or less, Dear sir, dentistry "*has riz;*" we cannot now, as in years past, prepare students and send them out as proficient dentists even in three years.

There are colleges instituted to complete the education of dental students for the duties of the profession, affording opportunities not usually found in private practice.

Does such an answer discourage the inquirer, the dentist has but performed his duty to the applicant, to the profession, and, perhaps, saved an untold amount of mischief to the public.

Another twofold evil exists, for which not only dentists, but their patients are alike responsible, viz., the reduction of dentists' fees below a standard that will stimulate the operator to put forth his best efforts for success.

It is a well-known fact, that in any branch of industry, the most competent and skillful workman can command the highest comparative wages. We say comparative, from the impossibility to establish a universal price list to suit all localities and conditions of people. The dentist who may receive five dollars for professional service in our largest cities, would find it more difficult to obtain two dollars for the same service in this city, or even one dollar in a remote rural district.

Notwithstanding this, no dentist is doing honor to himself or justice to his patient, who consents to labor for a pittance so small as to deprive himself of the opportunities of experiment, reading, or other means necessary for professional improvement. Because our patients demand of us cheap dentistry, and go dental shopping to find a dealer in that article, that is no reason we should accept their proposals and consent to render service for a remuneration so small that to perform the task well would cause a sacrifice of time, or in the attempt to make ordinary wages by like operations, be compelled to manipulate in an unwarrantable degree of slight and haste.

Gentlemen, as members of this association, let us present a bold front to this growing evil, learn what is our duty, and stand for the right.

If we cannot adopt one standard of prices, let us know the minimum of the lowest scale. There is a zero in the scale of each member, below which to settle would be disrespectful to the operator, disgraceful to the profession, and in most cases detrimental to the patient.

This matter of price rests with the profession. As the price of merchandise conforms to the premium on gold, so will the efficiency of dental labor conform to the facilities afforded or enjoyed for experiment, investigation, and improvement.

The dentist possessing proper respect for his own reputation or the good of his patients, can but feel that he must be "a man of science as well as a mechanic;" and, unless he is willing to avail himself of every means within his reach to obtain such knowledge, is not worthy of the confidence of the profession or the patronage of the public.

And, in conclusion, as we have formed an association, and given our names as members of the same, let us cast aside all professional jealousy that we may have entertained from the imperfect knowledge we have of each other as gathered from price-bidding or disaffected patients, and hereafter cherish toward each other feelings of friendship and respect.

Let us be slow to believe all the derogatory reports we may hear against the honor or proficiency of our brother in the profession, remembering that such reports, like rolling snowballs, lose nothing by the journey. And while this "association may become to its members a dental school, its members acting as teachers and pupils," may it also be a school of professional etiquette, setting forth examples of friendship, forbearance, and forgiveness.

ALVEOLAR ABSCESS.

BY C. P. FITCH, M.D.

Read before the "Brooklyn Dental Association."

In the enunciation of any truth, however simple, it is highly important that it should be clothed in such terms as to be patent to the understanding of those whom it is designed to benefit or elevate to its own plane of being. It is quite evident that the best phraseology to subserve this purpose is that which has been generally employed by the erudite and sharp investigators in that particular line of thought; with this proviso, that it conveys to the inquiring mind truth in a terse, concise, and comprehensive manner. This is preferable than to employ that mode of expression which has no community of signification; yet, whenever a new term is introduced it becomes a matter equally of great importance that the meaning attached to it by its projector should be fully and clearly defined; otherwise confusion at once takes possession of the mind, and clearness of perception and comprehension become hazy, in consequence of the necessity of directing attention to the mere vehicle of thought instead of the truth itself. That the mind labors and is straightened many times on account of the paucity of words or poverty of language in its attempts to present and clearly unfold the truths which it apprehends, is a fact too well understood by those invoking illuminations to be for a moment questioned.

Alveolar abscess, in the quite recent past and at the present time, is pressing its claims upon the attention of the dental practitioner. Like

every other truth, which has a practical bearing, and tends to the alleviation, elevation, and purification of humanity, must, in its apprehension and reception, pass through its incipiency and development to maturity, and will, in its different stages of advancement, meet with quick, generous, or unfriendly opposition. A thousand will start up to crush it, while but here and there one will be found ready to step forward for its defense.

> "But truth crushed to earth will rise again,
> The eternal years of God are hers;
> Whilst error, wounded, writhes in pain,
> And dies amidst her worshipers."

As has been well remarked by a worthy gentleman of this society, alveolar abscess has no written history. Whatever history it has, if indeed it may be called a history, is quite fragmentary, and, with but few exceptions, rests with the individual minds of the profession.

In responding to the wishes of this society, I propose, in the short time allotted me for the reading of a paper, to direct your attention briefly to a consideration of the pathology and causes of alveolar abscess. Its primary pathology unquestionably is perverted nutrition, which may be stated as embracing two acts, viz.: depriving the part of its appropriate pabulum, and the non-timely removal of the debris of the tissue. The first may consist in a deficiency, either in quantity or quality, of the material designed as nourishment, or in a want of power to make the proper appropriation of that supplied, which has been denominated endosmotic action; while the second, or exosmotic action, may be interfered with, which act is the outward movement that sweeps into the circulating current the refuse matters of the structure. If there is lesion in either of these processes, disease is at once established, just in the ratio of aberration from normal function. The most minute of these functional acts are regulated and under the control of a central force, denominated nervous force. This force is the result of organization, and employs organic structure for its manifestation. It is quite liable to be perverted in its healthy action. A thousand influences impress it either favorably or unfavorably, through sensation, emotion, or it may be the will. Whenever unduly excited, nutrition, sooner or later, will be inevitably more or less disturbed. In addition to this there is a force denominated vital or life force, which may be called the modalic force. It is resident in the germ or molecule. Certain conditions are indispensable that it be rendered and continued operative. Its normal action depends upon a given quantum of heat, fluidity, aliment, electricity, etc. If these attendant conditions are not maintained at the normal life-producing standard, there is either no structural development at all, or malignancy of growth or monstrosity of being is produced.

The pathology of alveolar abscess is characterized by inflammation

presenting distinct stages—the irritative or incubative, the congestive or vascular disturbing, and the hemorrhagic or exuding stage. The first stage is purely initiatory or primary, interfering with the proper nutrition of the part. It goes a step further, and impresses, through the sensitive nature, the cerebro-spinal and sympathetic centres, invoking, however, very little immediate response other than inducing general disturbances, more or less severe, according to the intensity of the local irritation and the status of the general organism. During the different stages the reflex nervous action is quite variable. The brain, heart, lungs, stomach, liver, kidneys, etc. are more or less disturbed and thrown out of equilibrium of action, producing at times great restlessness, stupor, flashes of heat, with chills alternating, nausea, vertigo, darting pains through the head and face, simulating neuralgia, with great lassitude, etc. The primary stage is soon followed by either a sthenic or asthenic congestive stage, inducing partial or entire stasis, the degree of which depends upon the intensity of congestion, the character of the tissue involved, and blood discrasis. The sthenic or asthenic character of the congestion is referable to a plus or minus condition of the organism in reference to the character of the fluids as well as the normal action of the vital force. If the system be plus, the heart's action, being much increased under the spur of the reflex nervous force, determines blood to the part irritated, which is soon deluged with the vital current of life, summoned and sent for the purposes of repair and restoration. But the red corpuscles of the blood are arrested in their passage through the diseased part on account of capillary contraction, produced either from the stimuli of the local irritation or from a nerve centre, and per consequence the part soon becomes engorged. Dilatation of the capillary vessels soon ensues, either from mechanical pressure through the circulation, owing to an increased heart action, or from a paralysis of the peripheral capillary nerves.

The sthenic congestive stage is characterized by intense redness, slight increase of heat in the part, and usually with not much local swelling. The degree of pain depends to a great extent upon the nervous grade of textural organization involved. This stage terminates either by resolution, or by a hemorrhage, or an exudation. If by resolution, there is little or none of any kind of hemorrhage. Contraction of the capillary vessels is again gradually restored, thereby urging forward the blood, at first but partial, and at intervals through single capillary systems of vessels, until capillary circulation is fully established. If by hemorrhage proper, there is lesion in continuity of structure. If by exudation, the fluid products of the blood pass through the greatly thinned and distended capillary walls into the areolar or cellular tissue, producing gradually a great increase of swelling, heat, and pain; this last condition depends upon the number of nerve filaments involved by the mechanical pressure. Strictly speaking, inflammation terminates with the congestive stage. Hemorrhage and

exudation are but the issues of its extremity. They have been denominated the culmination of phlegmonic inflammation.

The exudate is susceptible of either reorganization, reabsorption, or degeneration and disintegration. Its plastic or non-plastic quality is determined by its peculiar character and the degree of stasis reached in the inflammatory act, which character and stasis are determined, to a great extent, by the blood crasis and the intensity of the congestive stage. As a consequence, we have the fibrinous, the albuminous, and the serous exudates. Each of these divisions has several varieties of exudates; hence exudates form connective and membranous tissue or degenerate into pus, ichor, gangrene. It is asserted by some that pus is the product of a pyogenic membrane; by others it is affirmed that it is the product of broken-down blood corpuscles, floating in a liquid (liquor puris) derived from the fluid portions of the blood. It is quite clear, however, the character of the exudate determines the resultant product to be either connective or supposititious, membranous; or pus, ichor, etc.

In the anæmic, or with that condition of system denominated asthenic, the congestive and exudative stages are not so intense, but usually more protracted. It is attended with very little heat, redness, or pain. The swelling is at times very considerable, owing to an infiltration of the contiguous tissues with non-plastic lymph, which indicates lesion in the textural or plastic condition of the blood. Pus, in these cases, is formed with either very little suffering or constitutional disturbance. The structure seems to yield more kindly to the diseased action, or at least the resistance is not attended with either that general or local disturbance which obtains in the sthenic condition.

The second branch of this subject, viz., the causes of alveolar abscess, very naturally divides itself into predisposing and exciting. The predisposing causes, doubtless, arise from vitiated states of the organism, which states or conditions have been induced by the retention of effete matters, originating either in the natural disintegrative processes or from organic or inorganic poisons, incorporated from the external into the living structure. These effete and poisonous agents, which deleteriously impress the sensitive and reflex nature, should have been eliminated through the natural conduits, or, in other words, the secerning and excretory apparatus. On account of some disturbance either in the structure or function, from a perversion of the vital and nervous or modalic and regulating forces distributed to the part, or from traumatic lesion, there has been a failure to remove that which nature, in her acts subservient to health, designed to expunge.

Health of the whole, as well as of a part, is the resultant of that ceaseless and ever-varying and harmonious antegrade and retrograde action of the molecules composing and discomposing the entirety of either structure, organ, or congeries of organs composing the living being, the completeness and incompleteness of which are ever alternating.

As eternal vigilance is the price of liberty, so ceaseless, harmonious molecular and intellectual activity is the basal condition of either physical health or mental purity and development. It follows, then, that the most minute physiological or pathological act contributes to the establishment of that condition which is denominated either health or disease. Hence a pathological diathesis, cachexia, or vitiated condition of body is a prolific predisposing cause of alveolar abscess. Indeed, it may be said that all the predisposing causes are rendered operative through the medium of systemic action, inducing either these general pathological conditions or focalizing their virus at some point of the organism. For instance, the action of mercury, up to a certain point, is promotive of healthy action, unloading the engorged and plethoric structures, but, pushed beyond this point, it becomes a powerful disorganizer of tissue, changing the plastic character of the blood, depleting the red corpuscles and robbing them of their liquid contents, thus defeating a very essential function of these blood disks as carriers of oxygen to the most minute ramifications of the animal economy, and ultimately spending its deleterious, focalized force upon the glandular system and mucous surfaces. Syphilis seems, in a very marked degree, to predispose to the formation of alveolar abscess. The soft and hard structures are thoroughly impressed with this virus, and to a less or greater degree made subservient to its dictum. It is a powerful disorganizing force, and when focalized soon accomplishes its work of disorganization, and when fully generalized, its mission of death. The same, in a modified sense, may be said of scrofula.

The exciting causes of this disease embrace all those irritating agents, whether of foreign or home origin, that topically impress unfavorably either the structure or function of the tooth or parts contiguous to it. These causes, when found associated and acting in concert with a depraved, vitiated, general tendency, induce the most stubborn and unyielding alveolar difficulties. These resultant, obstinate, local lesions have been recognized, perhaps, by the entire profession, from the fact of their great prevalency in each one's particular field of practice. These untoward results have been greatly deprecated, and the treatment employed has, in a majority of instances, been little more than palliative. Many have ignored all remedial treatment, other than to recommend and consign all this class of teeth to the tender mercies of extraction.

It is perhaps unnecessary to enter into a minute enumeration of the topical lesions which constitute the exciting causes of alveolar abscess. To mention one or two, however, I should regard prominent among them, and it might safely be said, the one more frequently implicated and operative than any and all others, is the devitalization of the nerve structure of the tooth, whether by design or otherwise. Especially is its prominence increased, in the ratio of the formation and retention of these de-

vitalized products, viz., sulphuretted hydrogen and a serous fluid mixed with pus and blood, denominated sanies, within the fang of the tooth. Periodontitis may also be a source of alveolar difficulty. The devitalization of the pulp always sustains the relation, to the abnormity, of cause, while periodontitis may sustain to it the relation of either cause or effect.

It is clear, then, that any and every exciting cause which either tends to the devitalization of the pulp, or to the establishment of periodontitis, whether it be from thermal changes operating through the cavity of decay, or through metallic stoppings, or from acrid oral secretions, however induced, or whether it be from mechanical injuries, implicating the health of these structures, by traumatic lesion, I say it is clear, whatever tends or produces the devitalization of the pulp and periodental inflammation, if left to its own action without remedial interference, will, in much the larger class of instances, produce alveolar abscess.

Allow me, in closing, to notice a practice which has been and still is, whenever adopted, a prolific source of this difficulty, and that is, the practice of destroying the nerve and subsequently filling the cavity of decay, leaving it in the fangs to disintegrate and rot, proving a source of much offense and suffering to the patient, and an ever-present progressive rebuke to the skill and erudition of the operator. But I am happy to note that this reprehensible practice is entirely ignored by the members of this society; and may we not hope that a happier day will soon dawn—yea, may we not say has already dawned—upon our profession, when this disease, which has destroyed the use and caused the removal of such a fearful ratio of diseased dental structure in the past, will in the future be fully recognized in its true pathology, causes, and treatment by all the members of our progressive specialty?

New York, June 26, 1863.

NITROUS OXIDE IN DENTISTRY.

BY J. S. LATIMER, D.D.S.

I to-day had the pleasure of seeing a number of teeth and fangs removed from the mouths of patients who were at the time under the influence of "laughing gas." The first case was a lady of some twenty years, and nervo-sanguine temperament.

She had some ten or twelve fangs to be removed. Dr. Colton administered the gas as for ordinary entertainments, save that the patient was sitting and the inhalation was continued much longer.

Two minutes were required to induce complete anæsthesia, when half the fangs were quickly removed, and three minutes from the commencement of inhalation, the patient was completely conscious. After waiting a few minutes for the bleeding to subside, inhalation was commenced and

continued the same time as before with the same results. There was no indication of excitement, and the anæsthesia was perfect.

A gentleman of some forty-five years, and nervo-bilious temperament, next took the chair. He had been suffering intensely for some time with periodontitis, and was, consequently, very nervous.

The first attempt to bring him under the influence of the gas was frustrated by the exhibition of some little excitement after he had inhaled about thirty seconds.

A second attempt, however, was more successful, and in one minute and forty-five seconds from the commencement of inhalation, the tooth was removed painlessly, though a most difficult one to extract. This patient was conscious that the tooth was being removed, but felt no pain.

Drs. Colton, J. Allen, W. B. Hurd, and Smith propose devoting their time and attention to the preparation of mouths for plates; dentists sending patients with instructions, can have their patients returned to them ready for the impression.

No doubt many dentists of this vicinity will be glad to avail themselves of this facility.

PROCEEDINGS OF DENTAL SOCIETIES.

PROCEEDINGS OF THE ODONTOGRAPHIC SOCIETY OF PENNSYLVANIA.

REPORTED BY G. W. ELLIS, M.D.

A MONTHLY meeting of the Society was held on Tuesday evening, July 7, at eight o'clock.

Vice-President, Dr. Kingsbury, in the Chair.

The minutes of the previous meeting were read and approved.

The Executive Committee submitted the names of the following gentlemen as candidates for membership: Drs. W. W. Wilkinson, G. Macknet, and E. J. Neall, of Philadelphia, Robt. L. McClellan, of Cochransville, and W. K. Brenizer, of Reading, Pa., who, upon separate ballot, were unanimously elected.

Dr. Flagg then presented the following paper upon

"ORTHODONTIA."

To the Members of the Odontographic Society of Pennsylvania.

GENTLEMEN:—In response to your appointment of myself as essayist of this evening, permit me to offer a short paper upon that division of dental practice which is denominated Orthodontia; and I beg your indulgence if, while passing over in the cursory manner which your knowledge of the subject would demand, the ordinary causes of malposition of

teeth, such as habits, hereditary transmission, etc. I dwell for a few moments upon that most fruitful source of trouble, the extraction of deciduous teeth, either for the purpose of "making room," as it is termed, or for the relief of children suffering from toothache.

I contend that there can be no practice more contrary to all sound doctrines, and more surely conducive to deplorable results, than this—no treatment which is more indicative of total ignorance, not only in the direction of anatomical mutation and physiological truths, but in the special department of dental therapeutics; for, who that has received proper instruction, has not means at his command by which he can allay the pain incident to ordinary pathological conditions within and about the deciduous teeth quite as promptly, and much more agreeably to the little patients, than by compelling them to submit to the operation of extraction?

There are, however, two conditions which, in my opinion, demand prompt removal of deciduous teeth, whether they are or are not decayed, and whether they be loose or firm; and these are, when the superior permanent centrals present posteriorly to the deciduous centrals, or when the inferior permanent centrals present anteriorly to their predecessors. Under these circumstances, the removal of the superior *centrals* in the first instance, and the inferior *centrals* in the latter instance, would be conducive to the insurance of a proper commencement for the placing of the anterior permanent teeth. After this I should advocate as a rule, universal as anything can be in this life of change and accident, that all the other deciduous teeth be retained (as they can be readily and comfortably) until they are either removed by the children themselves, or *could be* by the fingers of the dentist. I would not be understood as of the opinion that deciduous teeth *should be* removed with the fingers—though I very frequently thus remove them—but, in very many instances, from position or shape of roots, (if any exist, or if they only remain,) the removal may be effected more surely and gently by small forceps than in any other manner. I would at this time counsel against removing children's teeth with "elevators," for the employment of these instruments precludes any other than direct force, while some *rapidity* of motion is also desirable, with the view of lessening suffering, and with children I regard this rapidity objectionable, from the fact that quickness or suddenness of movement is productive of apprehension on their part, which is oftentimes more disagreeable to them than the endurance of pain; therefore, in an operation which must necessarily be almost painless, it is well that they should be *slowly* and *surely* made aware that such is the case.

I have extended these remarks further, perhaps, than would be strictly legitimate in a paper upon the *correction* of irregularities, were it not that I propose calling the attention of members to the fact that not only may irregularities be almost universally prevented by a proper mainte-

nance of the deciduous organs, in order that they shall perform the part allotted them by nature during the period embraced between the seventh and eleventh years of life, but that they may be made to subserve the important office of remedying that most unsightly deformity of the face, caused by the protrusion of the inferior maxilla and consequent malocclusion of the teeth. For the correction of this form of irregularity, the ordinary practice has long been the adaptation of a plate over the teeth of the lower jaw, upon which inclined planes were so arranged as, by occlusion with the upper teeth, these should be forced outwardly, and, at the same time, some backward movement of the lower teeth be effected by producing a certain amount of change in the angle of the inferior maxilla. The application of this force is dependent upon one of two causes, viz., the persistent efforts of the patients themselves in closing the teeth upon the planes, or by means of pressure with elastic bands arranged over the head and under the chin, after the manner of the Fox bandage, for preventing luxation during extraction. By means of these appliances, the corrections of very bad cases of this irregularity are sometimes effected in astonishingly short periods of time; but, on the contrary, it is not unfrequently the case that month after month passes by without any manifestation of progress, and I have operated for many patients who, after a due trial, (as they or their parents thought,) had abandoned the apparatus which, while so unsightly, so worrying, so productive of pain, and so unpleasant from accumulations of food, notwithstanding daily visits to the dentist for its removal and cleansing, yet seemed to accomplish nothing which could be regarded as compensating for so much infliction.

These latter cases are never on account of the inefficacy of the apparatus, because of its efficacy there can be no doubt; but they are the result of a want of proper co-operation, or, in some instances, of intentional disobedience on the part of patients. Children will so protrude the lower jaw as to bite behind incredibly long planes, and, upon the least accession of tenderness, they will only eat such soft food as can be manipulated with the tongue, and never touch the planes at all. They will also complain of the hurting of the strap, and parents would rather discontinue its use than have their own or the children's rest disturbed, and thus the *dentist* accomplishes—*a failure!*

Now this conclusion may seem unjust, and yet there is much truth in it, for I think that in the correction of irregularities all apparatus should be *self-acting*—so constructed as to require no co-operation on the part of patients, and, moreover, so arranged as to prevent the possibility of their interference with its workings. In consequence of these views, I have, for several years, abandoned entirely the use of inclined planes, and have substituted for them, in correcting cases of the kind under consideration, a combination of wire, ligatures, and gutta-percha, which arrange-

ment I can much more clearly elucidate by means of models than by description.

Fig. 1.

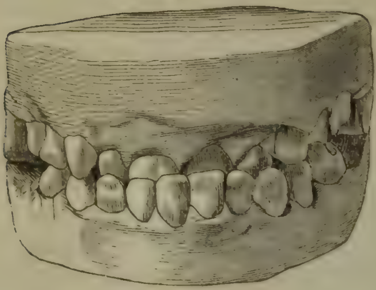

Fig. 2.

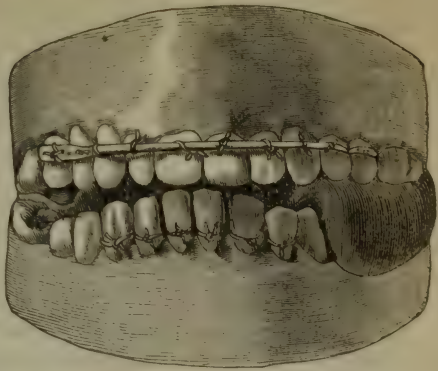

Fig. 1. Miss A., aged 14. Inclined planes had been adjusted upon the teeth of this patient, and worn for a period of one year. From want of co-operation upon the young lady's part, and from disinclination to bite upon tender teeth, no result was obtained.

Fig. 2. Front view, showing gold wire adjusted to upper teeth, silk ligatures thrown around lower teeth, and gutta-percha guard, to prevent occlusion, moulded upon left lower molars and bicuspid. The wire was secured by ligatures to the four superior bicuspids, and *one central* was gently brought forward by silk. After it touched the wire, it was firmly attached, and thus having gained strong points at either end and in the centre of the wire, the remaining teeth were brought into position with much ease and rapidity.

Fig. 3.

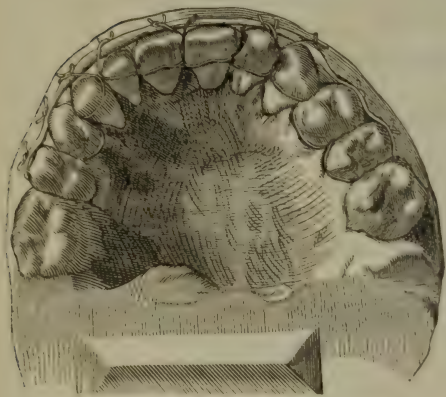

Fig. 4.

Figs. 3 and 4. Inside views of both jaws, showing attachments to wire upon upper teeth, and the apparatus which was used for *drawing the lower teeth in*. Silk ligatures were thrown around the twelfth year molars, (both sixth year lower teeth had been extracted by the gentleman who had employed the inclined planes with the view of insuring the correction.) India-rubber rings (from tubing) were secured to these teeth, and *attached together* by a short double *silk* ligature; silk was then passed around the lower front teeth, and the two rings stretched, as is very clearly demonstrated in Fig. 4.

It seems to me that every argument which could be adduced would favor the treatment which I here suggest, and that no arguments tending to oppose it can be presented which would have weight either with un-

biased practitioners, or, what is of quite as much importance, the patients themselves. Parents and patients constantly, during the progress of "corrections," draw comparisons most unfavorable to the plate, plane, and strap method, either in the form of reminiscences in relation to their own sufferings, or congratulations in the comparative exemption from pain and annoyance which is enjoyed by their children. But time will not permit so lengthy a consideration of this part of the subject as might prove both interesting and instructive, and I therefore shall briefly consider (and illustrate by models) the possibility of great advance toward, and sometimes entire completion of, the correction of the irregularity under discussion, simply by due attention to the deciduous teeth and the application of an occasional ligature.

Fig. 6.

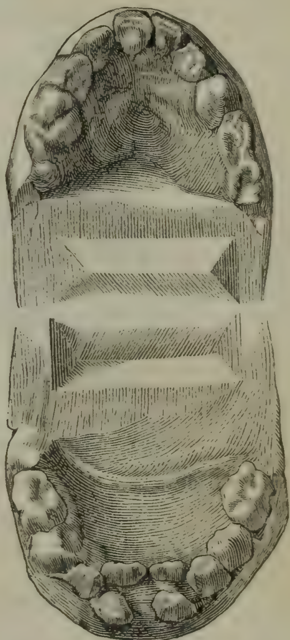

Fig. 5.

Fig. 5. Miss L., aged 7. All the *superior deciduous teeth* inside the inferior; marked protrusion of lower jaw; a family peculiarity.

Fig. 6. The same, open; the deciduous inferior incisors were tied to the laterals to insure the presentation of the inferior permanent centrals *posterior* to the superior deciduous centrals.

The fact of the more frequent presentation of the lower permanent teeth *posteriorly* to the deciduous is probably known to all of you, and it is my practice, both by teachings and ligatures, to prevent any attempts on the part of parents which shall result in removing or even loosening the deciduous teeth, so long as it is possible to retain them with any comfort to the patient. By this means the inward inclination given to the inferior permanent centrals is so great as to frequently insure their position under the superior centrals, and if it is indicated, by the presentation of the superior centrals in the rear of the superior deciduous centrals, that this will not be accomplished, I at once remove the superior deciduous

centrals and direct pressure to be made with the thumb on the palatine faces of the permanent centrals. The position assumed by the thumb is such as will at the same time naturally press upon the labial faces of the lower teeth, and thus a good result is almost always effected.

I regard the accomplishment of a natural occlusion between the centrals as more than half the battle gained, for it will readily be seen, by examining the dental preparations of subjects under six years of age, that the position of the forming teeth is such as will indicate their being governed, to a very great extent, both as regards eruption and location, by the proper or improper placing of the anterior teeth, for the laterals are formed *posterior* to the centrals in the inferior jaw, and *anterior* to the centrals in the superior jaw. The models which I present for your inspection, and which it has of course taken two years to obtain, will demonstrate to you at once the feasibility and progress of such corrections as I have endeavored to describe.

Fig. 7.

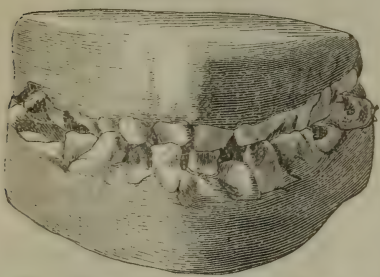

Fig. 8.

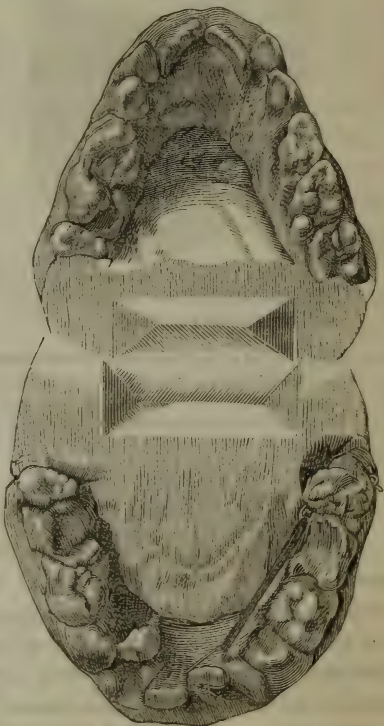

Fig. 7. The superior deciduous centrals were extracted upon the first indication of presentation from the superior permanents; the thumb used to make pressure to throw them forward; the inferior deciduous centrals have been lost naturally, and the occlusion is *almost* as would be desirable.

Fig. 8. The same, open; ligature securing slight rubber ring thrown around lower sixth year molar, and attached to left central, exercising *gentle* traction. Was tied on at 8 o'clock A.M., and at 1 o'clock P.M. was removed, and the tooth secured with silk, *completely under* its permanent antagonist; when the relative development of the other two teeth will *insure retention*, the same process will be repeated with them, probably in the course of two or three weeks from this writing. By this means a serious deformity will have been corrected without annoyance either to patient or practitioner; without trouble to the latter, and without pain or much expense to the former.

It would be impossible, within the limits of a paper intended to inaugurate discussion, that any portion of the treatment of the various cases of irregularity, which constantly present in ordinary practice, should be de-

scribed. I wish it were otherwise; for too often do we read in our dental periodicals most elaborate descriptions of complicated adjustments of screws and tubes, plates and bars, springs, bands, and planes, in connection with diagrams of cases, which could be corrected more easily, more quickly, less painfully, and more satisfactorily, both to patient and operator, by the simple but efficacious adjustment of a few silken ligatures and a few rings of elastic tubing.

I would say, in conclusion, that one thing is indispensable for the accomplishment of good results by this method of treating irregularities, and that is, *a knowledge of knots*—for teeth are so shaped, so rounded, and so smooth that ordinary tying will not avail much. But there are knots which meet every emergency, from the "figure-of-8" for protruding incisors to the "secured loop" for turning the roundest tooth. These are only to be taught by demonstration, and acquired by repeated trial and some little experience.

Dr. Fitch said that he regarded the subject as one of great practical interest to the dentist, and thought that the paper just read had taken a practical and common-sense view of its various points. In the treatment of irregularities he had endeavored, as far as possible, to simplify the apparatus employed, thereby saving the time and trouble necessary for the construction of complicated machinery, avoiding the annoyance which such appliances occasion the patient, besides insuring a more rapid and certain result. In the use of the inclined planes he had seldom been successful, the failure resulting from want of co-operation on the part of patients, who will mostly devise every means to prevent occlusion of the tender teeth, thus defeating entirely the object desired. He had obtained the best results by the use of silk ligatures without waxing. He seldom employs rubber, on account of the *constant* traction maintained and the consequent soreness and liability to inflammation. This objection does not apply to the silk; and, while the rubber will soften in some mouths, allowing the teeth to recede into their former position, the silk will hold them firmly in place when moved.

He described a case in which he had expanded the arch and protruded the front teeth by means of bars and screws, an apparatus consuming considerable time in its construction, and believed that the same result might be obtained by means much less intricate and troublesome. He dwelt upon the importance of permanently ligating teeth after the correction of irregularities, sufficiently long to insure a deposition and organization of new tissue for their retention. He thought that many dentists did not recognize the direction in which the permanent teeth should present in relation to the temporary ones. This knowledge he regarded as indispensable to success in preventing and correcting dental deformities.

Dr. Wardle said he could appreciate the paper read by Dr. Flagg, and thought it of incalculable value. He had some experience in correcting

irregular teeth, and thought if there was one part of our science more calculated than another to call forth the drudgery of thought, it is here, in the correcting of irregularities. There is great importance in knowing when to remove and when to leave deciduous teeth. He knew of a case in which all the deciduous teeth were removed before the seventh year. When consulted to do something for the child, as she could not masticate her food, having only the four centrals and the four molars, being somewhat amazed when asked what could be done, he replied, "There has been too much done already; the child must suffer until nature aids her." This treatment occurred in a high place, at least in a popular view.

He had treated some cases of extensive protrusion of the lower jaw, and has used Fox's bandage, which is recommended in his work, to prevent dislocation. He found it to perform well when properly applied. He has now a case of the kind in hand—the young lady is eighteen years of age—which he undertook very reluctantly, on account of her age and the extent of the deformity, the inferior incisors projecting about three-eighths of an inch beyond the superior teeth. To the parents he admitted there was a bare possibility of improvement. They determined to have it tried. The case, in about six months from commencement, presented the incisor teeth even on their faces. He has yet to make some of the side teeth articulate. He had no doubt but that the cause of this deformity is owing to the want of tone in the muscles of the child during infancy. It is a well-known fact that the inferior maxilla of the infant is but slightly curved—it can scarcely be said to have any angle at the ramus of the jaw—hence, if there is a want of muscular power during early childhood, the maxilla will continue to elongate until the lower incisor teeth are beyond the superior incisors, producing the projecting chin and impaired enunciation.

Another case of irregularity had fallen under his care, viz., the projecting upper teeth, without any apparent cause, with wide spaces between each tooth, the front teeth presenting a fan-like appearance. The subject was a dental student, but is now an officer in the army. The case was commenced to rid the profession of what he would consider a lasting disgrace, should it continue in our ranks. To reduce these teeth to conformity, he made a plate to fit the palatine surface, which was retained by clasps to the side teeth; at the back part of this plate were two little eyes, about on a line with the lateral spaces; to these eyes were attached two small bits of rubber, and to the rubber four independent ligatures, having two strands each; each of these independent strands was fastened to a separate tooth, and occasionally changed until the four teeth were reduced to their proper place, and then retained by the usual means. The cause of this deformity was in consequence of sucking the thumb, a habit denied by the patient, but which the doctor detected him in during the progress of treatment.

Dr. Gorges said that Archimedes had been credited with saying, if he had a fulcrum to place his lever, he could move the world. The doctor, in his first attempts at the correction of irregularities, used almost exclusively metallic appliances as strong as could be swedged or fitted to the parts. He had met with much success in the use of inclined planes, especially in cases where the teeth were but partially developed. He has resorted to the use of rubber and thread ligatures; described a case, (the models of which were exhibited, representing the mouth before and after treatment,) in which, by ligatures, he produced what complicated apparatus failed to do. He uses thread, as the flax fibre possesses more contractile force than silk. He found, on suspending against a board, a strand of thread and silk, each six inches in length, with flat weights attached, that, upon wetting them, the thread contracted a half inch, while the shortening of the silk was hardly perceptible.

Dr. McQuillen said that, as no remarks had been made with regard to the cause or causes of irregularities, he would take occasion to direct attention to four prominent causes. 1. Hereditary predisposition. 2. Bad habits. 3. Accidents. 4. Premature extraction.

1. Hereditary predisposition. The opportunities frequently afforded of observing the contracted jaws, or the disproportion between the superior and inferior maxilla running through families, passing from parents to children, were not only interesting as subjects of study, but also suggested that, where such predispositions were known to exist, the proper remedial treatment might be commenced at a sufficiently early period to obviate the difficulty; and it was possible that, by continuing this care, in the course of one or two generations the predisposition might be broken up. As an appropriate illustration of the hereditary tendency, he would direct attention to the plaster cast in his hand of the teeth of a little girl aged nine. It would be observed that the superior lateral incisors are very much behind the arch, and that they strike inside of the lower teeth. Exactly the condition of affairs exists in another cast, now offered, of the father's mouth. The grandmother of this family also had irregular teeth. The father applied to a dentist, when about eighteen years of age, to have the irregularity corrected, and, singular to say, was told that it could not be effected. The plan proposed for the little girl's case was to use an inclined plane of hard rubber, fitted to the lower teeth, and a silver bar, to be applied to the labial surface of the upper incisors, with gum-elastic rings passing back of the laterals. With regard to the inclined planes, he could not agree in tabooing them entirely. In some cases they had proved very useful in his hands. The hard rubber was preferable to metal, on account of the fact that the substance could be filed away so rapidly that but little time would be required in making any alteration demanded.

2. Bad habits. A common practice among infants after weaning, and

frequently continued for years afterward, of sucking their thumbs, was a prolific cause of that form of irregularity in which the superior incisors bulge forward and rest upon the lower lip. The disposition on the part of parents to permit their children to indulge a preference for soft food, almost to the entire exclusion of everything that requires a decided effort in mastication, (as instanced in the rejection of crusts of bread, etc.) was also highly reprehensible. The force demanded and the shock attendant upon the mastication of hard food was of decided advantage in enlarging and expanding the maxilla. The attention of parents should be directed to these facts.

3. Accidents. Under this head might be included the various casualties which children are liable to from falls, or being struck by balls, bats, etc., in which premature loss of the deciduous teeth is followed by a contracted arch. An interesting case of this kind had come under his care within the past month, in which the daughter of a neighbor, aged four, was struck in the mouth by a bat, in the hands of a boy. The right superior central incisor was knocked out of the mouth and the lateral loosened, so that the slightest touch severed the connection with the gum. Dr. McQ. saw the child one hour after the accident, and believing that an effort should be made to prevent the contraction of the arch, incident to the premature loss of the teeth, he replaced the incisor, after syringing the alveoli with tepid water; then closed the jaws of the patient tightly, and kept them so by Barton's bandage. In the course of the evening he mentioned the case and treatment to Dr. Garretson, who suggested the propriety of employing, in addition, gutta-percha as a splint, to keep the teeth in position. Accepting this as a valuable addition to what had been done, he called at the house of the patient, and after softening a piece of sheet gutta-percha in warm water, moulded it to the teeth and gums of the upper jaw, and then renewed the bandage, with instructions to the parents that it was not to be removed for two or three days, and that in the mean time the child was to be kept as quiet as possible, and to be fed on highly nutritious fluids, beef tea, chicken broth, etc. These instructions, however, were not carried out. By some means the bandage was loosened, so that the child could move the lower jaw, and she was allowed to eat as best she could, with the gutta-percha splint in her mouth, the ordinary articles of food. As a consequence of this, when the splint was removed at the end of three days, although the teeth were in their proper places, the central incisor was quite loose. In the course of that day the connection of the tooth was entirely severed, by the patient biting on a hard substance. No further effort was made to effect a reunion, and about a week after this the lateral was lost in the same manner. Although the treatment in this case was not successful in its results, it was instructive in its teachings. Had the patient been seen directly after the accident, or had the gutta-percha splint been kept in place, it was

possible that reunion might have been effected. The plan adopted was worth trying again.

4. Premature *extraction.* Of this it was not necessary to say more than that the impropriety of such procedure is not only universally recognized by the profession, but the general intelligence of the people on this point is becoming more and more extended.

Dr. Kingsbury stated that the correction of irregularities of the teeth was a most perplexing branch of dental practice. In many cases it required great perseverance and patience on the part of both patient and operator. It is the least remunerative of any branch of his practice, yet it offered a field for the exercise of the highest order of inventive genius and skill.

He had almost abandoned the use of inclined planes, and had substituted gum-elastic rings and ligatures. Had treated recently a number of interesting cases, and had several in course of treatment at present; but the lateness of the hour would forbid his speaking of them in detail on this occasion.

Upon motion, the meeting adjourned to reassemble on Monday evening, July 13, for the election of delegates to the National Association, and the further discussion of the subject under consideration.

An adjourned meeting of the Society was held on Monday evening, July 13th.

Vice President, Dr. Kingsbury in the Chair.

The following names were presented by the Executive Committee, and, upon ballot, the gentlemen unanimously elected members of the Society: Drs. Geo. F. Platt of Chambersburg, J. G. Garretson, J. Warner Knox, and Henry Ahl, of Philadelphia.

An election for the choice of delegates to represent the Society in the American Dental Association, to be held in Philadelphia on Tuesday, July 28th, was then entered into, resulting in the appointment of Drs. J. Gilliams, C. A. Kingsbury, Wm. Gorges, and Ambler Tees, of Philadelphia, W. K. Brenizer, of Reading, and John McCalla, of Lancaster.

The further consideration of "Orthodontia," the subject of the previous meeting, was then in order.

A member of the profession, who was present by invitation, exhibited the models, and gave an accurate description of a very interesting case, in which he had obtained the most perfect and gratifying result. The case was one of more than ordinary interest, and, judging from the description, presented unusual difficulties, not the least of which was the necessity of making the attachments of the apparatus to the very teeth which it was desirable to move. The various obstacles were met and overcome, and at the expiration of five months an irregular and disgusting set of teeth was transformed into an even and pleasing contour.

Dr. H. Townsend said that he had for the past three or four years employed inclined planes constructed of hard rubber; he regarded it as preferable to metal, being more readily adapted, easily bent to meet any inclination, and feels clean and pleasant in the mouth. He sometimes rivets a piece of gold or platina to increase the thickness of the plane. He also employs rubber for upper regulating plates, and for the expansion of the arch finds it very efficacious. Rubber apparatus for the correction of irregularities would, he believed, eventually supersede the metals.

Dr. Wardle described a case in which he was engaged in moving the molars and bicuspids backward by means of wedges, in order to gain room for the reduction of an irregular cuspidatus. He wished to suggest an addition to the classification of causes of irregularity which had been offered, viz., that protrusion of the lower maxillary was sometimes produced by a laxity or want of tonicity in the masticatory muscles, allowing the jaw to drop, its own weight having a tendency to increase the angle and carry it both downward and forward; this idea he had never heard advanced, and it occurred to him as affording a satisfactory explanation of the cause of this condition.

Dr. Flagg thought that the removal of the permanent teeth might be classed as another cause of irregularity; those remaining so change their position as often to produce a very imperfect occlusion. He described and illustrated the various knots found useful in securing ligatures for the regulation of teeth.

Dr. McQuillen was pleased with the theory of Dr. Wardle, and believed, upon reflection, that certain cases which he had met with in practice were confirmatory of that view, the relaxation of the muscles having been quite marked. He called attention to the fact that Africans mostly have well-developed jaws, and teeth evenly implanted in the arch, cases of irregularity being exceedingly rare.

Dr. Townsend had noticed the fact relative to Africans mentioned by Dr. McQuillen, and had further observed the tendency to irregularity to increase in proportion to the admixture of white blood, the mulatto being much more subject to such deformities than the pure African.

Dr. Kingsbury dwelt upon the importance of the six year old teeth, and advocated the employment of every effort for their preservation, as contributing vastly to a proper position of the permanent set, and from their immediate value as masticatory organs; these facts he always endeavors to impress upon the minds of both parents and children.

Dr. Wardle said that as the association of ideas is always a great aid to the memory, he had adopted a very simple method of impressing upon the minds of parents the number of temporary teeth, in order that due attention might be given the six year old teeth upon their first appearance; his plan was to tell them that the number of temporary teeth is ex-

actly the same as the number of fingers and toes, and he has had the pleasure of obtaining from so trifling a suggestion most valuable and timely assistance from parents.

Dr. McQuillen moved that delegates be empowered to fill any vacancies that may occur in the number to which the Society is entitled, in order to insure a full representation—carried.

Adjourned.

THE CENTRAL NEW YORK DENTAL ASSOCIATION.

At a meeting of dentists from Onondaga and adjoining counties, held in Syracuse March 2d, 1863, for the purpose of establishing a uniform fee list for dental operations, a resolution was passed to form a dental association in Central New York, to embrace within its limits that portion of the State bounded on the north and south by the State lines, on the west by Cayuga Lake and the eastern boundary of the Dental Association of Western New York, and on the east as far as practical, the exact line not designated.

An adjourned meeting was held in Syracuse March 23d, at which a permanent organization was effected, to be known by the name of The Central New York Dental Association.

The following officers were elected to serve one year, or until their successors should be elected:—

Dr. D. S. Ball, of Auburn, *President.*

Dr. D. W. Perkins, of Baldwinsville, *Vice President.*

Dr. S. B. Palmer, of Tully, *Secretary.*

Dr. A. T. Smith, of Syracuse, *Corresponding Secretary.*

Dr. E. M. Skinner, of Syracuse, *Treasurer.*

The Association adjourned to meet at the same place on the 20th of April.

A constitution and by-laws were adopted, and several new members received. The Association will hold two regular meetings each year, an annual meeting on the second Tuesday in May, a semi-annual on the second Tuesday in November, at such place as the members shall designate at a previous meeting.

The objects of the Association are to "cultivate the science and art of dentistry and collateral branches, to elevate and sustain the professional character of dentists, to promote among them mutual improvement, social intercourse and good feeling, and collectively to represent and have cognizance of the common interests of the dental profession in Central New York.

"All practicing dentists within the territory of Central New York, in good standing, shall be eligible to membership, and may become members by signing the articles of the Association and paying an initiation fee."

An adjourned meeting was held in Auburn on the 12th day of May, which is reckoned the first regular meeting of the Association. The meeting was well attended, and much interest manifested. New members were added, and an address read by Dr. S. B. Palmer "On the Advantages of Associated Labor,"* presenting the claims of the profession and the public upon each other.

An essayist was appointed to prepare a paper to be read at the next meeting; subject, "The Importance of Preserving Natural Teeth." The discussion to follow, "The Best Means to Accomplish that Object."

The Association adjourned to meet in Syracuse on the second Tuesday in November, 1863.

S. B. PALMER, *Secretary.*

PITTSBURG DENTAL ASSOCIATION.

THE fourth regular meeting of this Association was held at the Infirmary, No. 251 Penn Street, on the evening of the 4th of June, 1863.

The President, Dr. Orr, in the Chair.

Present, Drs. Sill, Westbay, Depuy, Gillespie, Templeton, Vandevort, White, C. King, J. King, Williams, and Duncan.

It might not be out of place here to give a brief history of its formation and progress. This Association has been in existence since the 26th day of February, 1863, and has prospered in that short space of time beyond the most sanguine expectations of its founders, its meetings having been held weekly up to the present date. The officers of this Association are—Dr. J. Orr, President; Dr. M. E. Gillespie, Vice-President; Dr. J. D. White, Secretary; and Dr. J. Westbay, Treasurer. So far, its members have been confined to the Cities of Pittsburg and Alleghany alone, and number some twenty-two names; but through the medium of the DENTAL COSMOS, we now beg leave to extend an invitation to all dentists throughout the State "who may feel disposed" to join us, more especially those of Western Pennsylvania.

Feeling that it would tend to the elevation of the profession, and also benefit the poorer class of our community, this Association has, with one voice, established a *Dental Infirmary* in our midst, where all operations will be performed at rates to suit the above-named class. The Infirmary is conducted by a Board of Trustees, "regularly elected by ballot at each annual meeting," who shall report monthly to the Association. Success seems to have crowned our efforts in this undertaking, and indications seem to say it will be a "permanent institution."

Persons desirous of joining our Association can ascertain our terms by addressing the Secretary, J. D. White, Alleghany City, Pa.

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* This paper will be found in another part of the DENTAL COSMOS.

The minutes of the previous meeting being read and adopted, the meeting proceeded to business.

Dr. Duncan, of this city, and Williams, of Monongahela City, were elected members of this Association, both being present.

A very able and elaborate essay upon the Properties of different kinds of Plaster was read before the Association by Dr. M. E. Gillespie.

On motion of Dr. Depuy, a vote of thanks was tendered the reader.

This essay being rather lengthy, I have concluded to withhold its publication for the present, as I have already encroached too far upon your valuable space.

On motion of Dr. Sill, the Association proceeded to elect five delegates to attend the *American Dental Association*, to be held in Philadelphia in July next, resulting in the choice of Drs. Sill, Depuy, King, Orr, and Vandervort.

On motion of Dr. Sill, the proceedings of this meeting be forwarded to the DENTAL COSMOS, of Philadelphia, for publication.

On motion, adjourned.

J. D. WHITE, *Secretary.*

EDITORIAL.

PLUGGING SENSITIVE TEETH.

MR. M. told us, a few days ago, that he had a tooth drilled, and the dentist endeavored to pick out the nerve, a few years since, and the tears ran down his cheeks; still he did not consider it as actually weeping, but it was to all intents and purposes shedding tears. He remarked to the dentist, Doctor, that is very severe; cannot something be done to relieve me of such severe pain? No, was his reply; I have nothing to do with that, the patient must always bear the pain—I must make a good job. He left his dentist as soon as he could get out of his hands, vowing he should never venture to get into them again. You, he said, destroyed the nerve, and I have never had any pain in it since. The patient said, that if the operation was necessary, he did not think the remark was, as he ought to be the judge of his own feelings, if the dentist had none. This is an old-fashioned way of operating, and is much to be deprecated. It is doubtless true that many dentists have contracted this idea, from the fact that in old times the surgeon cared little about the suffering of the patient in his operations; success was all he had in view, or had to care for as far as the immediate or ultimate results of the operation were concerned, and it was considered *heroic* to "put the case through." Since the days of anæsthesia, this doctrine will not obtain, even in heavy surgery, and how any one could ever

have adopted it in dentistry, we cannot imagine. There is nothing we have to contend with which gives us so much trouble as to train in *frightened* patients. To attempt to crush the nervous sensibilities of a highly organized patient, and to train them to bear pain, is only in many instances to raise up greater resistance, and instead of the patient's courage *living* under the suffering it *dies.* If a dentist succeeds in performing an operation under such circumstances, once or twice, it is not a success; while a patient may hold up under the pain for the time being, he may never raise his courage to the sticking point again.

An old gentleman remarked to us a few days since, that while he wished to pay every attention to his children's teeth, he had let his own go, because some thirty odd years since he had some operations performed on his teeth which caused him so much pain, he could never screw his courage up to the sticking point to attempt it again. He never approached a dentist's office but a thrill ran through him similar to the pain he suffered at that time. This plan of operating might apply to some cases where it is a necessity for want of time on the part of the patient; when the bone only is tender, it might apply also to adults—it never applies in young patients. To palliate the sensibility of the dentine is as much a part of the operation to success, as preparing the cavity or introducing the gold. When we first introduced the practice of palliating tender bone, it was condemned by nearly all, if not quite all in the profession; and nothing could have induced us to adhere to such practice against such opposition, except the fact that we were operating successfully daily for patients from other dentists; and we will here remark, and we believe it to be true, that the success we have met with in establishing a large practice has been more from paying a due regard to the *painlessness* of our operations, than their *perfection,* which latter point so many aim at. It does not matter how well an operation is done in its mechanical results, if it has cost too much pain to do it. Still we deny that as efficient operations can be done while the patient is writhing under pain as when they can be performed deliberately.

We consider this matter so self-evident from daily experience, that it seems a useless task to write about it; and we have no object in view in speaking of it except to urge upon all for humanity sake, and on the part of the young practitioner for the sake of success in practice, never to plug a tooth until by palliatives it can be handled so as not to be too painful to be done well, or to cause the patient to say he would not go through with the operation again, or to cause him to shrink from its repetition.

J. D. W.

REVIEW OF DENTAL LITERATURE AND ART.

BY J. H. M'QUILLEN, D.D.S.

PHOTOGRAPHY IN ITS RELATIONS TO THE EFFECTS OF AGE, ASSOCIATIONS, ETC. ETC. ON THE FEATURES.—The following reflections were induced by the perusal of the article on Photography, by Prof. Holmes, from which the extract presented in the July number of the DENTAL COSMOS was made. It was intended that this communication should accompany the extract, but limited time and space prevented.

When it is remembered that within the few square inches comprised by the human face, room is found not only for traits of all of one's ancestors, but also that the cares and anxieties, the joys and sorrows, the hopes and fears, and the moral, mental, and social associations and trainings of the past of a person, leave ineffacable traces, which are perceptible to the most obtuse, if they will exercise their perceptive faculties, and which enable the keen and philosophical observer to form a *fair* estimate of the past experience and present and future capabilities of the individual, it is not a matter of surprise that Lavater, and others, who have made the human face a special object of study, should have been so enthusiastic with regard to it. Moore, it is true, has said—

> "In vain we dwell on lines and crosses,
> Crooked mouths, or short probosis :
> Boobies have looked as wise and bright
> As Plato, or the Stagyrite;
> And many a sage and learned skull
> Has peeped through windows dark and dull."

While this is undoubtedly true in exceptional cases, there is more of poetic imagination than actual truth in a broad application of such assertions; for there is almost invariably associated with high moral and mental manifestations, or the reverse, an unmistakable evidence of the fact on the brow of the person. It may not be evident at a first and superficial glance, or when the features are in repose; but the spirit which brings the muscles of expression into action speaks through them in a language not easy to be mistaken.

All persons, from the lisping babe to the hoary patriarch, are more or less physiognomists; in other words, are attracted or repelled by the expressions of the face. With the many, the impressions formed are instinctive and emotional in their character, rather than the results of calm and philosophical reasoning. The opinions arrived at under the former conditions of mind, as a general thing, are not very reliable, and are apt to be abandoned as quickly as they were adopted, and are quite as unimportant in their results as hasty conceptions generally are; but

those whose duties bring them in contact with large numbers of their fellow-beings must, of necessity, depend in a great measure on the physiognomy for an estimate of the character and capacities of those who come before them as strangers for a brief period only; and while it would not do to rely implicitly and irrevocably on such data, a person of large experience, possessed of fair perceptive and reasoning faculties, is not likely to be led far astray in his conclusions.

It is not merely as a means of forming an estimate of character that the face becomes an interesting and important object of study. To the artist, whether as a sculptor or a painter, who aims to excel as a delineator of nature, it recommends itself with peculiar force. Every one's attention is liable to be attracted by strongly-marked and characteristic features. A high and expanded forehead, a prominent nose, and dark and expressive eye, or a mouth indicating firmness of purpose, are not likely to escape observation and comment; but to perceive and retain in the memory those fine shades of difference which exist between the mass of faces, (that are so much alike, and yet so dissimilar,) and delineate them in marble or on canvas so perfectly that there can be no question as to the resemblance, requires peculiar natural gifts, combined with long-continued and careful study of the face during life, when by the action of the muscles of expression it is constantly undergoing a thousand and one changes, and by frequent dissections of the cadaver to ascertain the size, shape, origin, and insertion, and the relations which these muscles bear to one another and the surrounding parts.

To no one, however, does the study of the human face, in its various forms and aspects, recommend itself with more force than to the dental practitioner; for, called upon as he is, not only to relieve suffering humanity from the greatest pain to which flesh is heir, but also to repair the ravages of decay, either in efforts directed toward the preservation of the natural organs, or, when these are lost, to supply artificial substitutes, if he is not as quick to perceive and as able to retain in his memory the nice shades of expression of the same face, and the characteristic points of resemblance or difference between various individuals as the sculptor or painter, he will fail in many essential particulars to meet all the just and proper demands upon him.

A practitioner always on the watch, and quick to perceive the slightest change of expression in the face of his patients when operating in the neighborhood of an exposed pulp, or in administering an anæsthetic, will be much less likely to give unnecessary pain, or bring life in jeopardy, than those who are indifferent with regard to such matters. Again, it is not reasonable to suppose that a symmetrical and natural appearance can be given to teeth much broken up by decay, when the effort to file or fill them is intrusted to one who has not paid due attention to the form, position, and relations of the dental organs in their normal condition; or

that such a one can arrange and insert artificial substitutes with any certainty that they will preserve or restore the old and familiar expressions of the face, so well remembered and possibly admired by friends and acquaintances. Opportunities, indeed, are sometimes offered, requiring little or no effort to improve the appearance by the introduction of artificial teeth; but to accurately meet the varied complexions and forms of face which present themselves, so that the results shall prove faultless in their adaptation, is deserving of the highest meed of gratitude and praise on the part of the patients.

As the most careful observers and the best judges of what constitutes a natural expression, can only form an approximate estimate of the expression of those whom they are called on to serve after the loss of natural teeth, it is reasonable to infer that valuable assistance would be found by bringing in the aid of photography to determine nice or doubtful points under such circumstances. Indeed, as the memory of man is so treacherous, it would be of assistance even in cases where the face is long and well known to the operator. At a period when photographs are so much in vogue that they are used as "*cartes de visite*," and when it is the exception where persons have not sat for their picture, the dentist will have little or no difficulty in securing full-face, quarter-face, and profile views of patients taken long before the loss of the teeth. With these in hand, the skillful and artistic practitioner will be able to preserve or restore, or if need be improve, the old and familiar expressions.

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REMOVAL.—Within the past two months, Dr. C. P. Fitch has removed to the City of New York, with the intention of locating there permanently, much to the regret of his professional friends and patients in Philadelphia, who had learned, during his residence among them, to appreciate his superior qualities as a man and a practitioner. In entering upon his professional duties in his new home he carries with him the best wishes of all his friends, and the earnest desire that the just claim he has upon the favorable consideration of the community may meet with a prompt and extended recognition and encouragement.

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DENTAL REVIEW, LONDON—MAY.

"ODONTOLOGICAL SOCIETY OF LONDON. March 2d, 1863. SAMUEL CARTWRIGHT, JR., ESQ., President, in the Chair.—At the conclusion of the special meeting of the Society, of which we gave a full report in our last number, the ordinary meeting was held, when Mr. Walker read a paper on 'Dental Exostosis, its Pathology and Diagnosis.'

"By the term exostosis should be understood a purely bony mass set upon a bone, forming with it an organic whole, and, where it is possible, originating or proceeding from the bone. When its development is complete, and often at the beginning of its growth, its texture is always homologous with that of its base and point of origin, whether it be compact or spongy. Hence all new growths upon or within a bone which

holds any other relation to it are excluded, although they may be more or less composed of such texture altogether. Bony growths which proceed from the periosteum, but sooner or later become united with the bone, are admitted.

"Exostoses are composed sometimes of compact, sometimes of spongy, bony substances, although some are made up of both of these substances. In dental exostosis we find specimens of both these classes, ivory exostosis being the more frequent.

"Again, small nodules are found attached by a narrow base to different parts of the surfaces of the fangs, and even to the crown portion of the tooth.

"The other class of dental exostosis that we have alluded to is the spongy.

"The new growth of bone constituting spongy exostosis is sometimes observed upon the articulating surfaces of the alveoli. These abnormal growths are much more rare than the preceding, and may with propriety be named 'enostosis.'

"The author considered that inflammation of the peridental membrane must be regarded as the first step to the formation of exostosis, and gave detailed accounts of the process by which the new growth was gradually formed.

"With respect to the frequency of exostosis, Mr. Walker stated he had examined a considerable number of teeth (about 10,000) lately, both diseased and sound, with the object of ascertaining the relative frequency with which exostosis occurs in different teeth and at different ages.

"Carious teeth, 6200; exostosed, 319.
Sound teeth, 3000; exostosed, 85.

"With regard to carious teeth, of which 6000 have been examined, I find the relative frequency to be as follows:—

"1st Molars, in 4000	210 exostosed.
2d Bicuspids, in 2000	94 "
3d Incisors and Canines 250	10 "

"Sound teeth, of which I examined about the same number, may be divided into two classes, viz., 1st. Those extracted from subjects, 1 over thirty years of age. 2dly. Those subjects, 1 under thirty years of age.

"1st Class,		2d Class,	
1st in Bicuspids, 688	27	1st Molars, 200	5
2d in Molars, 250	8	2d Bicuspids, 500	12
3d in Incisors and Canines, 2160	50	3d Canines and Incisors, 1000	20

"It will be observed in these tables that exostosis is at all times least frequent in the incisors and canines. Why exostosis is more common in carious molars than in other diseased teeth, I know not, unless it be from the greater extent of membrane which surrounds the fangs, and from that structure being peculiarly pressed upon at the angles formed by the bifurcation of the fangs, and the greater amount of force brought to bear on these teeth in the act of mastication, causing in the course of time a degree of looseness of the teeth in the socket.

"Why, in the second class of sound teeth, the bicuspids are most frequently affected, no satisfactory explanations can be offered.

"The deposit is always less in sound than carious teeth. No reason has been assigned why the peridental membrane should become the formative membrane of this new deposit, and then entirely to cease its active condition; which evidently must be the case, from the fact that the deposit is always so circumscribed and so small in quantity, unless from some constitutional affection setting up inflammation in the peridental membrane for a short period, the deposit of bone being the result of that inflammation. Of the constitutional causes of these attacks of periostitis, he believed rheumatism to be the most frequent. It is proved that rheumatism affects all the fibrous tissues of the body. The valves of the heart, and particularly their edges, which possess a more fibrous tissue, is a good example.

"There is the same peculiarity in the structure of the periosteum; it is fibrous in nature and very vascular, and of this circumstance we are in the habit of taking advantage, by rotating teeth either at once, or by gradual pressure, to rectify malposition without loss or injury to the tooth.

"If the peridental membrane can be shown to possess the function of the new formation of bone without the necessary production of cartilage, then he could see no reason why the inflammation of the periosteum produced by rheumatism may not induce the condition of exostosis.

"Syphilis and gout may also be considered predisposing causes of exostosis; he thought so from analogy in the effect of these diseases in other bones, viz., the production of nodes. But the nodes found on teeth attributable to syphilis differ somewhat in shape and appearance from that generally known as exostosis as shown in the diagram.

"The last division of this subject, was the diagnosis of exostosis from other diseases.

"The most frequent cause of anxiety to the practitioner is the difficulty of diagnosing between a true case of exostosis and neuralgia. This is rendered obscure when the deposit of bone is developed in sound teeth, and in very small proportions.

"The most faithful guide, in his opinion, was that in neuralgia the pain was intermittent, at times more intense and acute, affected by atmospheric influences, increased by anxiety and distress of mind by the general conditions of the system; while on the other hand, however small the deposit, the pain is constant, with no intermission, uninfluenced by sleep and rest, or the administrations of narcotics, anodynes, or tonics.

"Another disease with which exostosis may be confounded, is incipient disease of the temporal bone from otitis.

"The chief means of distinguishing these will be in the character of the pain, which, in otitis, is always augmented by pressure about and behind the ear, and by movement of the lower jaw. Hearing will also generally be more or less impaired or confused. After a time, varying much in different cases, and depending most on the degree of acuteness of the inflammation, the diagnosis will be complete by the discharge of fluid from the meatus, at first thin and watery, and then purulent. With this discharge the pain usually abates, unless indeed the inflammation extends also to the internal ear, when the symptoms will be both more severe and of longer continuance. He had a case in which he was

tempted to remove the wisdom tooth; but, feeling some doubt as to its being the real cause of the symptoms present, delayed for a time, and the case turned out to be disease of the temporal bone. Suppuration took place behind the ear; the probe could be passed in to the extent of twelve inches. After about one month's discharge of the purulent fluid, the part has now healed.

"In another case under treatment at the same time, and presenting similar symptoms, but with this great distinction—that the pain, although it increased as night approached, yet was not increased by pressure about the ear. The pain was entirely removed, and with it the complaint, by the use of iodide of potassium, after tonics and sedatives had failed to give relief.

"After some discussion, the meeting adjourned.

"*April 6th*, 1863. Samuel Cartwright, Jr., Esq., President, in the Chair.—Mr. Tomes said two very valuable preparations had been sent him for presentation by Mr. Hare, of Limerick. One was a most interesting example of exostosis. The tooth, a molar, was taken from the upper jaw of a countryman, of forty-one years of age, who had suffered severe pain in the jaw for some years, and was troubled with an opening in the cheek, from which matter had constantly poured. He would pass the specimen round. The members would see that the newly developed tissue exceeded four or five times that of the tooth. He had looked out from his museum the preparation of a horse's tooth which had been in his possession twelve or fourteen years. It was very curious, and he had not seen any other that at all resembled it, and he now brought it forward as an example of the same amount of abnormal development occurring in a lower animal as they found in the human tooth presented by Mr. Hare. They had here another interesting specimen, but one not so rare as the specimen of exostosis. The specimen he now exhibited was the portion of a tooth placed topsy-turvy, and united to the neck of what appeared to be a wisdom tooth of the lower jaw. Mr. Hare stated that this specimen was extracted from a servant-girl, aged twenty-five years, and when she first visited him her mouth was with difficulty opened, and by friction he discovered the organ. She had since the operation been quite free from pain. Perhaps the members of the Society would call to mind the preparation he exhibited some year or so back, in which there were two teeth, the crowns of which were directed in an opposite direction. In this case the supplementary tooth was placed about the neck of the normal tooth."

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Dental Review, London—June.

The accompanying description and diagrams of a pair of forceps, recently invented, are presented on account of the novelty of the instrument, and the high encomiums offered to the French Academie Imperiale de Medecine, by a committee appointed to examine and experiment with it. In addition to a highly complimentary recommendation of the forceps, the committee suggested that a "Silver Medal" should be awarded to the inventor by the Academie, which was done.

While regarding it as a duty to give the readers of the Dental Cosmos prompt notice of the invention, the writer does not feel at liberty to offer an opinion either for or against the instrument without seeing and trying it.

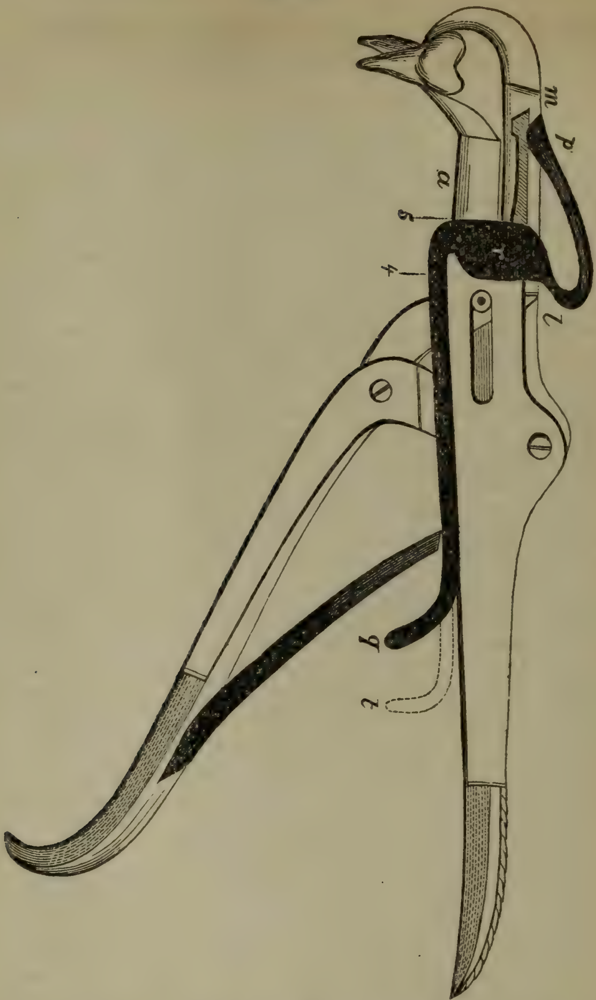
"THE NEW PATENT FORCEPS. By MONSIEUR D'ESTANQUE. Communicated by Mr. F. Oppenheim.—The newly-invented patent forceps represented in the accompanying wood-cut are the invention of M. D'Estanque, a French surgeon, whose representative I am in England. The principle upon which they are constructed consists of a novel application of the inclined plane to the extraction of teeth, and may be understood by reference to the drawing. Fig. 1 represents the forceps as applied to a tooth of the lower jaw; they consist of two handles, of which the upper one *a* carries the inclined plane *c*, corresponding to the under claw in a hawk's-bill forceps; the lower handle *d* has its fulcrum in the point *b*, and is connected with the upper claw *e*, the attachment being concealed in the interior of the handle, which is hollowed out for that purpose. The action of the instrument will at once be understood. The two handles being pressed together as in an ordinary pair of forceps, the lower handle draws the upper claw in the direction of the inclined plane *c*, and removes the tooh from its socket, as represented in the drawing. The screw *e* secures a spring which keeps the upper claw pressed down, but allows it to rise as the tooth is drawn from the socket. A spring serves to keep the handles apart. The manner in which the forceps operate is as follows: the tooth to be extracted being one of the lower jaw, the extremity of the upper claw *e* is placed at the internal neck of the tooth, the lower claw or inclined plane is placed at the external neck or front part of the tooth; this is done in the easiest manner, by holding the instrument as an ordinary hawk's-bill, and by slightly pressing the handles of the instrument together, the extremity of the inclined plane or lower claw is brought down in the process slightly lower than that of the upper claw, say one-fiftieth of an inch, then the operator lowers his hand, this being done to prevent the lower claw slipping down farther, and finally presses the two handles together.

Fig. 1.

"The whole of the operation is performed in the easiest manner possible, the operator having only to hold and apply the forceps as an ordinary hawk's-bill, and as soon as he feels, by the resistance, that the tooth is 'grasped,' to 'lower his hand' and press the two handles together. The effect upon the tooth is now obviously understood; the inclined plane forming an angle of about 60 degrees with the horizontal line, the tooth is forced in a position, the maximum deviation of which would form an angle of 30 degrees with its own axis, or receives a lateral motion to

that amount, having for its natural consequence to widen the alveolus and loosen the tooth.

Fig. 2.



"Various claws are adapted to this instrument and can be shifted to suit the different teeth to be extracted; the lower claw or inclined plane requires no particular notice. The upper claw having to resist a traction is secured by a spring and a catch which keeps it in its position until removed. The number can be increased according to the ideas of the dentist; and henceforth will replace that dangerous instrument, the elevator, with ease and safety. The inclined plane, which is the most important part of the instrument, as represented in the drawing, is hollowed out so as to encircle the tooth; the lower part of it is 'blunt,' so as not to cut the fang, and is terminated by two points on each side, so as to allow the fang to slide up easily on it. The upper claw is hallowed also, and the points differ according to the teeth they are intended for."

PERISCOPE OF MEDICAL AND GENERAL SCIENCE IN THEIR RELATIONS TO DENTISTRY.

BY GEO. J. ZIEGLER, M.D.

"*General View of the Function of Innervation.* By JOHN HUGHES BENNETT, M.D., Edin., F.R.S.E., Professor of the Institutes of Medicine, and Senior Professor of Clinical Medicine in the University of Edinburgh. —In a previous lecture I directed your attention to the structure and functions of the nerve tubes, and especially dwelt upon the property they possessed of conducting the influence of impressions in different directions, so that there resulted, when these influences were carried to muscles, motion; when conveyed to the gray convolutions of the cerebrum, sensation; when conducted to the glands and textures, secretion and nutrition; and when sent to the blood-vessels, congestions and disturbances in temperature. I now propose speaking more particularly of the special functions of the cerebrum, cerebellum, spinal cord, and ganglionic system of nerves.

"*Cerebrum.*—This portion of the nervous system consists of that mass of gray and white matter situated above and outside the *corpus callosum*, composing what are denominated the two cerebral lobes. In these the gray matter is external to the white, and has been appropriately named the hemispherical ganglion by Solly. It is arranged in the form of anfractuosities, whereby a large surface is capable of being packed in a comparatively small space. On carefully examining a thin section of this structure, prepared after the manner of Lockhart Clarke, and steeped in carmine, the white substance in the adult may be seen to be composed wholly of nerve tubes. These become more and more minute as they reach the gray matter of the convolutions, and are gradually lost in it. The layer of gray matter consists of a finely molecular substance, in which are imbedded minute nerve cells, varying in shape and size.

"The cerebral lobes furnish the conditions necessary for the manifestation of the intellectual faculties, properly so called, of the emotions and passions, of volition, and are essential to sensation. That the evolution of the power especially connected with mind is dependent on the hemispherical ganglion, is rendered probable by the following facts: 1. In the animal kingdom generally, a correspondence is observed between the quantity of gray matter, depth of convolutions, and the sagacity of the animal. 2. At birth, the gray matter of the cerebrum is very defective; so much so, indeed, that the convolutions are, as it were, in the first stage of their formation, being only marked out by superficial fissures almost confined to the surface of the brain. As the cineritious substance increases, the intelligence becomes developed. 3. The results of experiments by Flourens, Rolando, Hertwig, and others have shown that, on slicing away the brain, the animal becomes more dull and stupid in proportion to the quantity of cortical substance removed. 4. Clinical observation points out that, in those cases in which the disease has been afterward found to commence at the circumference of the brain, and proceed toward the centre, the mental faculties are affected *first;* whereas in those diseases which

commence at the central parts of the organ, and proceed toward the circumference, they are affected *last*.

"The gray matter, therefore, evolves that force or quality which is essential to mind, and the conditions necessary for this are evidently connected with its molecular and cell structure. The white matter, on the other hand, conducts the influences originating in, and going to, the gray matter. These may be said to travel in four directions: 1st, outward to the circumference of the body along the nerve tubes; 2d, inward and upward to the hemispherical ganglion; 3d, from one hemisphere to another by the commissures; and 4th, from the anterior to the posterior lobes, and *vice versâ*, by the so-called longitudinal fibres of the hemispheres. This power of conducting mental influences in various directions is probably subservient to that combination of faculties which characterizes thought.

"By the term sensibility I understand the peculiar vital property possessed by nervous substance of conducting the influence generated by impressions made upon it. By sensation I understand the mental consciousness of such impressions. Now the experiments of Flourens, Hertwig, Longet, and others have shown that, on removing the cerebral lobes from animals, the mental faculties, including, of course, consciousness and volition, and therefore sensation and voluntary motion, are abolished, while the creature can stand when put on its legs, fly when thrown into the air, and walk when pushed. Hertwig has kept pigeons in this condition for three months, deglutition and all other reflex acts being perfect, the mental faculties only absent. Longet and Dalton have recently maintained that sensation may exist without the cerebral lobes. The former says, when the cerebrum was removed from a pigeon, and a light suddenly brought near its eyes, there was contraction of the pupil, and even winking. Further, when a rotatory motion was given to the candle at such a distance that no heat could operate, the pigeon made a similar movement with its head. But of these facts I would observe that the pupil will contract on the application of light when the eye has been cut out of the head, and a sunflower follows the course of the sun. It cannot, therefore, be said that under such circumstances the eye and the flower possess sensation or can see.

"Dalton's description of what occurs after removal of the cerebrum is as follows: 'The effect of this mutilation is simply to plunge the animal into a state of profound stupor, in which he is almost entirely inattentive to surrounding objects. The bird remains sitting motionless upon his perch or standing upon the ground, with the eyes closed and the head sunk between the shoulders. . . . . This state of immobility, however, is not accompanied by the loss of sight, of hearing, or of ordinary sensibility. All these functions remain, as well as that of voluntary motion. If a pistol be discharged behind the back of the animal, he at once opens his eyes, moves his head half round, and gives evident signs of having heard the report; but he immediately becomes quiet again, and pays no further attention to it. Sight is also retained, since the bird will sometimes fix its eye on a particular object and watch it for several seconds together. Ordinary sensation also remains after removal of the hemispheres, together with voluntary motion. If the foot be pinched with a pair of forceps, the bird becomes partially aroused, moves uneasily once or twice from side to side, and is evidently annoyed at the irritation.'

"From the observed facts Dalton concludes that 'the animal is still capable, after removal of the hemispheres, of receiving sensations from

external objects. But these sensations appear to make upon him no lasting impression. He is incapable of connecting with his perceptions any distinct succession of his ideas. He hears, for example, the report of a pistol, but he is not alarmed by it; for the sound, though distinctly enough perceived, does not suggest any idea of danger or injury. There is accordingly no power of forming mental associations, nor of perceiving the relation between external objects. The memory, more particularly, is altogether destroyed, and the recollection of sensations is not retained from one moment to another. The limbs and muscles are still under the control of the will, but the will itself is inactive, because apparently it lacks its usual mental stimulus and direction.'

"I think the facts may be interpreted differently and more correctly. The turning round of the animal's head on the explosion of a pistol, and many other movements, may be altogether reflex, dependent on irritations communicated to the cranial portion of the spinal cord through the tympanum. Again, that the pigeon should open its eyes with a vacant stare, or apparently fix them on an object, is no proof of sight. We constantly do these things ourselves with the brain entire, and see nothing. Lastly, that the limbs and muscles are under the control of the will, while the will is inactive, appears to be contradictory language. One of the most active operations of the will is to direct motion; and to say of a bird which flies away on the production of the slightest noise in health, but does not move on the discharge of a pistol, that in the latter case its limbs and muscles are still under the control of the will, appears to be a most unfounded conclusion. The truth evidently is that there is no will, no sensation in such a case, any more than there is in a sensitive plant, which shrinks on being touched, but which surely cannot be said to exercise either the one mental faculty or the other.

"With regard to the relation existing between mind and brain, two views are contended for: one, that the brain originates; the other, that it is only the instrument of thought. The discussion is metaphysical rather than physiological, because the phenomena observed in either case are the same, and these depend upon the structure and quality of the organ itself. In this respect the brain is exactly similar to a nerve or muscle. It possesses properties and functions which it is our duty to study. Why it does so we are ignorant, and are content to regard them as ultimate facts in our science. In the same way, therefore, that contractility is a property of muscle, sensibility of nerve, growth of tissue, and secretion of gland, so we regard thought as a property of the brain. But, to avoid metaphysical subtleties, we are quite willing to say that it furnishes the conditions necessary for the manifestation of mind.

"From the various facts now known, I think it may be concluded that the cortical substance of the cerebral lobes furnishes those conditions which are necessary for thought, including all mental operations, sensation and volition. I do not think that in the present state of science we are warranted in proceeding further, for the same facts entirely negative all those theories which have been advanced having for their object a localization of the different faculties into which the mind has been arbitrarily divided. Some have maintained that volition is seated in one place, memory in a second, sensation in a third, and so on; but we have no sufficiently extended series of facts to establish any of these or of similar propositions.

"There can be no doubt that the relation between the molecular, nu-

clear, and cell elements of the hemispherical ganglion, as the instrument of mind, must be most important; and yet I am not acquainted with any one who, having first qualified himself for the task by a prolonged and careful study of histology, has investigated the brain in cases of insanity. Psychologists content themselves with repeating well-known clinical observations, with the ordinary morbid anatomy or density of the brain, and with the metaphysical speculations which have been pushed as far as, if not further than, human intellect can carry them. Need we feel surprised that the true pathology of insanity is unknown? What we desiderate is a careful scrutiny of the organ. Hitherto the difficulties of such an investigation have been insurmountable, in consequence of our imperfect methods of research. But let any one possessing a competent knowledge of histology and the use of our best microscopes, with the opportunities our large asylums offer, only now dedicate himself to the task, and he may be assured that, while extending the bounds of science, he will certainly obtain an amount of fame and honor that few can hope to arrive at. The molecules on which muscular contractility depends are, as we have seen, visible molecules, and so I believe are those in the hemispherical ganglion, so essentially connected with the functions of the brain.

"*Cerebellum.*—The ganglionic surface of the cerebellum is structurally altogether unlike that of the cerebrum. On looking at a well-made vertical section of the former, prepared after the method of Lockhart Clarke, and steeped in carmine, under a magnifying power of 25 diameters, the fine tubular substance in the centre is seen to be bounded externally by a granular layer, outside which is a row of nerve cells with branched processes gradually terminating toward the margin of the exterior layer, which is finely molecular. On increasing the magnifying power to 250 diameters, we see more distinctly the relation of these various parts to one another, and recognize in the interior of each granule an included rounded body. According to Gerlach, these corpuscles are united to one another by a slender filament, which he has figured in a hypothetical diagram. Although such an appearance as he has imagined cannot be discovered in the natural structure, I have seen the tubes running between the granules, and traced them to the external margin of the granular layer. The external layer is the structure which demands the greatest attention. It is composed essentially of a finely molecular mass, containing numerous capillaries derived from the vessels of the meninges. Large ganglionic cells external to the granular layer send off branching processes externally, which are gradually lost as they proceed outward. Both in the external as well as in the internal granular layer the basis of the texture is evidently *molecular*—a fact which hitherto has received far too little attention.

"If the cerebellum be removed gradually from a pigeon in successive slices, there is progressive circumscription of the locomotive actions. On taking away only the upper layer there is some weakness and a hesitation in its gait. When the sections have reached the middle of the organ the animal staggers much, and assists itself in walking with its wings. The sections being continued further, it is no longer able to preserve its equilibrium without the assistance of its wings and tail; its attempts to fly or walk resemble the fruitless efforts of a nestling, and the slightest touch knocks it over. At last, when the whole cerebellum is removed, it cannot support itself even with the aid of its wings and tail; it makes violent efforts to rise, but only rolls up and down; then, fatigued with struggling,

it remains for a few seconds at rest on its back or abdomen, and then again commences its vain struggles to rise and walk. Yet all the while its sight and hearing are perfect. The slightest noise, threat, or stimulus at once renews its contortions, which have not the slightest appearance of convulsions. These effects, first described by Flourens, have been confirmed by all experimenters, and occur in all animals. The results contrast very strongly with those of the much more severe operation of removing the cerebral lobes. 'Take two pigeons,' says Longet; 'from one remove completely the cerebral lobes, and from the other only half the cerebellum; the next day the first will be firm upon its feet, the second will exhibit the unsteady and uncertain gait of drunkenness.'

"These facts induced Flourens to consider the cerebellum as the co-ordinator of motion, in which view he was supported by the late Dr. Todd and others. Foville, on the other hand, supposed it to be the seat of sensation, and argued that, as it is by means of this function that we regulate muscular motion, so, when it is destroyed, the faculty of perceiving the movements being lost, we cannot answer for their precision or duration. That it should be the seat of sensation generally, is disproved by the fact that the animal is evidently conscious of impressions after its removal; but that it should be the organ of that peculiar sense, which has been variously called 'muscular sense,' 'sense of resistance,' and 'sense of insight,' is very probable. Accordingly we find that Professor Lussana, of Parma, has recently brought together all the arguments which exist as to this matter, along with numerous original observations, confirmatory of the view that the cerebellum does indeed regulate motion, but in consequence of its being the seat of the muscular sense.*

"It has been suggested by Carpenter and Dunn that the corpus dentatum in the cerebellum is the ganglion which is connected with this sense, a view rendered improbable by Brown-Séquard's analysis of cases where the organ was diseased. I submit that the function is seated in the external layers of gray matter rather than in the corpus dentatum—a theory to which the same objections do not apply. Mind frequently remains when portions of the hemispherical ganglion are injured, although we know of no instance in which, where the whole of it has been diseased, intellect has been preserved. So the co-ordinating motor power may remain when parts only of the cerebellar leaflets are destroyed, but is certainly lost when the whole gray matter is diseased. That the cerebellum, therefore, is connected with a special sense, through which it influences the co-ordinate action of the muscles, is a doctrine worthy the attention of physiologists. Its external layers of gray matter, constituting a complex ganglionic structure, has probably the same relation to the muscular sense as the hemispherical ganglion has to sensation in general.

"*The spinal cord* has two portions—a cranial and a vertebral. The former consists of a chain of ganglia more or less connected with one another, as well as with the cerebrum above and the vertebral part of the cord below; the latter is composed of two lateral halves divided by an anterior and posterior fissure. Each half is subdivided into three columns —an anterior, middle, and posterior—by the two cornua of the central mass of gray matter. Through the centre runs the spinal canal, lined with columnar epithelium. The white matter of the lateral columns is composed of tubes, which, as shown by Lockhart Clarke, on being traced

* Journal de la Physiologie, tome v. p. 418 et seq.

inward from the spinal nerves, join the ganglionic cells in the gray matter, and, through them, keep up a communication: 1st, with the opposite lateral columns; 2d, with the cerebrum; and 3d, with the anterior and posterior roots of the nerves. The course of the conducting tubes, as pointed out by Clarke, shows that the views of Sir Charles Bell, though correct as to the functions of the roots of the nerves, were erroneous with regard to the columns of the cord. The few experiments Bell made on those roots confirmed the conclusions he drew from dissection. Had he experimented on the cord itself, he might have formed juster views. What he neglected, however, was performed by Brown-Séquard, with the effect of demonstrating that a section of the anterior columns does not produce paralysis of voluntary motion, nor section of the posterior columns prevent conduction between the brain and posterior roots. To produce either of these results, the section must be continued into the gray matter. If two sections be made, however, midway between two neighboring spinal nerve roots, then conduction between the parts above and below the sections is cut off. The explanation of this is to be found in the course taken by the nerve tubes, as shown by Lockhart Clarke, which so diverge from one another, on passing into the cord, that no one transverse section of the column can divide them, although two at a certain distance from one another may. Thus histological research and experimental investigation support one another, and the two have now demonstrated that the conducting nerve tubes of the spinal roots of the nerves communicate through the gray matter of the cord, not only with the brain and the two sides of the body, but with each other.

"These facts have served also to explain more fully the nature of those actions variously denominated automatic, reflex, and diastaltic, for the true knowledge of which we are indebted to the labors of Marshall Hall. It is now clear that the influences excited by irritation of nerves run continuously through the cord in certain directions, now communicating with muscles to produce spasms, and now with the glands and vessels to produce secretion and vaso-motor action, and this without any necessary connection with the brain, and therefore without sensation.

"*The ganglionic system of nerves* consists of numerous ganglia having connecting filaments, keeping up a communication with each other and with the cerebro-spinal centres. These communications are not direct, the various nerve tubes separating in a ganglion, and, whether they do or do not anastomose with nerve cells, on leaving it form a different combination of nerves. Hence every ganglion serves to break the conducting power of the nerves, or to modify it—probably both. In health we are not conscious of the actions of internal viscera principally supplied with these nerves, nor can volition act on muscular parts to which they are distributed. But let them be diseased, and they often excite excruciating yet peculiar pain, as in that caused by angina, by colic, or by a gall-stone. Again, mental emotions have a powerful influence on the contractions of the organic contractile tissue, as in palpitations of the heart, or as visible in blood-vessels on the production of pallor or of a blush. In the same manner mental emotions and desires act on the various glands, exciting or diminishing their action. Such results can only be explained by the connection known to exist between these nerves and the spinal cord. The same phenomena may be produced by direct stimulation or by reflex action, each ganglion being a centre through which afferent and efferent nerves communicate—the whole constituting an ex-

cito-nutrient and excito-secretory system, as has been well described by Dr. Campbell of the United States.*

"The observations as to the effects of injuring the trunk of the ganglionic system, more especially in the neck, have excited the attention of numerous physiologists since the days of Petit in 1727, and more especially of Dupuy, (1816,) Breschet, (1837,) John Reid, (1838,) Biffi, (1846,) Budje and Waller, (1851,) and finally of Bernard and Brown-Séquard, (1852.) Bernard discovered the remarkable increase of heat which followed section of the nerve, and Brown-Séquard showed that cold was produced on applying galvanism to it. It is now recognized that if we cut the trunk of the sympathetic, heat commences in the neighboring parts almost immediately, and will continue for weeks without producing inflammation, œdema, or other effect, so long as the animal remains in good condition. But if it falls sick, either spontaneously or in consequence of other operations, the nasal and ocular mucous membranes of the affected side become red and swollen, and secrete pus in great abundance. The inflammation of the conjunctiva described by Dupuy, J. Reid, and others, is therefore an accidental phenomenon produced by the debility of the animal, and may be avoided by giving it food and supporting its strength.

"Thus in the same manner that when we irritate a sensitive nerve we excite motion through a motor nerve, or secretion and nutrition through the nerves distributed to glands or to the tissues, so we excite cold by irritating the ganglionic system of nerves, and heat by destroying their action or exhausting it. These phenomena are those of fever."—(*Lancet.*)

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"*Cases of Convulsions arising from Carious Teeth.*—St. Bartholomew's Hospital.—The following notes have been furnished by MR. ALFRED COLEMAN:—

"*Case* 1.—L. C. G., aged seven years, a moderately healthy-looking child up to the age of four years and a half, when he had scarlatina severely, followed by glandular swellings. About four months since he was observed to avoid using his fingers, and would attempt to take up a cup between the backs of his two hands, for which his mother, thinking it was a childish trick, always scolded him and tried to make him take it up in the proper way, but without much success. Fancying his right arm was diminishing in size, she took him to Mr. Coote, who sent him to Mr. Coleman to examine his mouth. This was on a Saturday. In the afternoon of the same day, after having been seen by Mr. Coleman, the child was attacked with a fit of what his mother described as shivering in the right arm, the arm and fingers being drawn up as well as convulsed; his speech also seemed affected. Shortly afterwards, this was succeeded by another fit of the same character, which commenced with a feeling of pins and needles in the right shoulder, extending to the arm and hand. From the Saturday to the Sunday evening inclusive he had ten such attacks. On the Monday he had an epileptic fit, which lasted two hours, soon afterwards followed by another, which did not last so long.

"Wednesday.—The child has had no more epileptic fits; but the lesser seizures still continue, occurring very frequently. He appears much alarmed at them. His mouth and cheek are drawn up during a fit, and

* Essays on the Secretory and Excito-Secretory System of Nerves, etc. Philadelphia, 1857.

he cannot speak; but says, 'Mother, it is going,' as the attack is leaving him. On this day Mr. Coleman extracted his four temporary second molar teeth, all of which were decayed, but had given him little or no pain.

"May, 1861.—Has remained perfectly free from the before-mentioned seizures since the removal of the teeth until within the last two days, during which he has had seven slight attacks. One of the first temporary teeth was found to be carious, and it was removed about a week after this. His mother called and stated that he had one very slight attack since the removal of the tooth; she promised to bring him should a second occur, but neither mother nor child has been seen since that time.

"*Case* 2.—M. J., aged about twenty-three years; is healthy-looking, and enjoys very good health; suffers much from toothache, and during the fits has a tingling sensation in the palms of his hands and soles of his feet, but especially in the left arm. Several of his teeth were decayed, but not so much so as to require removal; they were filled with gold, since which he has had no return of pain or the accompanying sensations.

"*Case* 3.—M. B., aged about thirty years, a moderately healthy person, but suffers much from neuralgia in her head and face, and has had latterly during the attacks partial paralysis of the left arm. She was under the care of Mr. Coote, at whose request Mr. Coleman removed, while the patient was under the influence of chloroform, four carious teeth, some from each side of the mouth. She was greatly excited during the first stages of chloroform. Since the removal of the teeth the pain and partial paralysis of the arm have not returned. Some artificial teeth were constructed for her, which she says fit her very well, but cause, by pressure upon the gums where the teeth were removed, attacks of neuralgia of the face.

"*Case* 4.—Sarah B., aged nineteen years, pale and anæmic-looking. She suffers much from toothache, and during the fits loses completely the use of both arms; has a stinging feeling in the lips; her sight is also affected; has suffered loss of consciousness occasionally during the attacks. After a severe attack, twitching in the shoulders and arms lasts for two or three hours. Mr. Coleman removed a carious upper left bicuspid tooth, where she said the pain seemed to arise, and ordered her valerianate of zinc, in grain doses, three times a day. She was directed to return that day week, but has not been seen since.

"In the 'Transactions of the Abernethian Medical Society' will be found a paper, by the late Dr. W. Baly, 'On a Case of Epilepsy caused by a Carious Tooth in a Warder at Milbank Prison, cured by the removal of the Tooth;' with remarks upon the subject."—(*Ibid.*)

"*Mechanism of Dislocation of the Lower Jaw.*—M. Maisonneuve has succeeded in producing dislocation of the lower jaw on the dead body, by strongly depressing the chin, pushing the condyles forward by placing the fingers behind them, and suddenly raising the jaws by means of the index and middle fingers of each hand, placed behind and under the angle, so as to imitate the action of the masseters. This plan, he says, has never failed in more than thirty instances. On dissection, M. Maisonneuve has found that the condyles are carried in front of the transverse root of the zygomatic processes, and rest on their anterior face; that the coronoid processes, completely enveloped by the tendon of the temporal muscle, are depressed below the zygomatic arches, which they scarcely ever touch, and that they oppose no obstacle to bringing the

jaws together; that the capsule of the joint is much stretched, but is not torn; that the external ligament, of which the normal direction is oblique from before backward, becomes oblique from behind forward, and is stretched, as are also the spheno-maxillary and stylo-maxillary ligaments; that the temporal muscle is elongated, but its tendon is not torn; and that the external pterygoid muscles and masseters are strongly stretched, but that the general direction of the action of their fibres is in front of the dislocated condyles, and not behind them. M. Maisonneuve found also that reduction was not facilitated by dividing the coronoid processes at their base, nor by dividing the zygomatic arches, nor by opening the capsule of the joint. On dividing merely the stylo-maxillary and spheno-maxillary ligaments, as well as the posterior fibres of the external ligament, the dislocation was reduced by the slightest pressure. He believes that the difficulty of reduction depends on the fixing of the condyle in front of the transverse root of the zygoma, by the passive resistance of the ligaments and the energetic contraction of the elevator muscle. He concludes hence that the best method of reduction is to gently depress the chin so as to relax the ligaments, and to push the condyles strongly back by means of the thumbs, introduced into the mouth, and resting on the coronoid processes."—(*Gaz. Méd. de Paris* and *Amer. Journ. Med. Sciences.*)

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"*Permanganate of Potash as a Disinfectant.*—DR. PLOSS speaks in the highest terms of the disinfecting power of this substance. It effectually removes all smell from the most stinking suppurating sores and discharges. Most remarkable results of this kind have followed its injection, repeated several times a day, in cases of cancer of the uterus—half a drachm to eight ounces of distilled water being a good proportion. In the case of open wounds and ulcers, all the dressing covering them should be moistened with the solution. No means succeeds more rapidly than this in removing the disagreeable smell of the hands after the performance of autopsies, for which purpose a stronger solution (ʒss ad ℥j) may be employed. It is far superior to chlorine in its effects, which are not, as is the case with that substance, fugitive. For this reason it is a superior prophylactic, applied to the hands of accoucheurs, to chlorine in puerperal fever. In ozæna it is strongly to be recommended, the solution (℈ss ad ℥viij) being introduced into the nares by means of a caoutchouc syphon. In bad smells of the mouth, resulting from carious teeth, it is an admirable means, a little cotton wool being moistened in a weak solution. Finally, the permanganate is to be recommended as a wash for stinking feet. This remedy deeply stains linen it comes in contact with, but the spots may be removed by means of the sulphate of iron."—(*Med. Times and Gaz.*, from *Varges' Zeitschrift*, and *Ibid.*)

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"*Physiology of Tasting.* By MR. NORTON FOLSOM. When a substance to be tasted is placed in the mouth, we press it with the upper surface of the tongue against the palate, and thus force its particles in every direction. The saliva, poured in by its glands responsive to the stimulus, aids in dissolving and disseminating the particles over the mouth. When the substance reaches the fauces, and as it is swallowed, a current of air escapes from the glottis, and carries any volatile portion to the posterior nares, where it is liable to affect the sense of smell. Plainly, therefore, in order to separate the two sensations, we must either shut off the cavity

of the nose during the tasting, which can be done by most persons voluntarily by breathing through the mouth and applying the soft palate to the back of the pharynx, or we must interrupt the current of air through the nares, which can be done by holding the nose with the fingers.

"We recognize two classes of impressions made by articles of food—one of *savors*, of which salt affords an example; the other of *flavors*, as that of vanilla. Most substances have both properties; thus a strawberry has an acid and a sweet taste, besides its own delicious flavor.

"The distinction between these classes has not, indeed, been fully made by physiologists until of late; and still less has the fact been recognized, that *all flavors are perceived by the organ of smell only*, reducing the number of impressions which the organ of *taste* is capable of receiving to four only, viz., Sweet, Sour, Salt, and Bitter. This can, however, be easily and certainly demonstrated. Let the nose be closed by the fingers, or let the posterior nares be shut off by the soft palate, and a solution of vanilla be taken into the mouth and swallowed. It cannot be distinguished from water. Soup, nutmeg, cheese, pineapple, and assafœtida are alike entirely *flavorless* under similar conditions, though the *ordinary sensibility* of the mucous membrane, and the perception of the four savors above mentioned, may enable us to apprehend certain *other* qualities which distinguish these substances. The common practice of holding a child's nose while it swallows disagreeable medicine, has its origin in this peculiar relation of these two senses.

"We have now to consider the exact locality of the sensations produced by these four classes of stimuli. Experiments have been tried by various physiologists with entirely different results, which may be attributed to want of care, and to not recognizing the fact that all *flavors* should be excluded from the investigation. All agree, however, in this—that, to be tasted, a substance must be brought to the sensitive part *in solution*, inasmuch as insoluble substances have no taste.

"In the experiments performed by the writer, solutions of white sugar, tartaric acid, common salt, and sulphate of quinine were carefully applied to various parts of the mouth and fauces by means of a camel's-hair pencil, pains being taken that no excess of fluid should be used, which might diffuse itself over other parts than that directly under observation. The following results were uniformly obtained on six different individuals, they all being unaware of the substances used in each experiment:—

"1st. The upper surface, tip, and edges of the tongue, as far back as to include the circumvallate papillæ, are the *only* parts concerned in the sense of taste; the hard and soft palate, tonsils, pharynx, lips, gums, and under surface of the tongue being entirely destitute of this sense.

"2d. The circumvallate papillæ are by far the most sensitive portion of the organ. They perceive, at once, very minute quantities of any one of the four substances used, and are particularly sensitive to bitter. Irritation of these papillæ by pressure, or placing a drop of cold water on them, excites decided sensations of bitterness.

"3d. The central portion of the dorsum of the tongue, to within half an inch of the edge, is the least sensitive portion. Substances are distinguished with difficulty, or not at all, when applied to it.

"4th. The edges and tip of the tongue are quite sensitive, the edges becoming less so as we come forward. They recognize all the four classes of substances. The tip detects bitter with great difficulty, but is particularly sensitive to sweet. A sweet sensation, sometimes mingled with

sour or salt, is produced by gently tapping it with any insipid soft substance.

"The tongue possesses *ordinary sensibility* to a marked degree, especially at its tip, and in this way detects the size, shape, and texture of substances. It is in the same way that the qualities of pungency and astringency are perceived, which fact is proved by their being nearly as perceptible to the conjunctiva, or any other mucous membrane possessing ordinary sensibility, as to the mouth. A solution of tannin, applied to the circumvallate papillæ, gives the sensation of extreme bitterness, while at the tip it produces a slight sweetish taste, especially after it has been washed off by the saliva. These sensations are entirely distinct from the puckering, which, as just said, is perceived by other mucous membranes. The application of a solution of potassa gives nearly the same result, proving that there is no such thing as a distinct alkaline taste."—(*Boston Med. and Surg. Journal,* from the *Boylston Prize Essay.—Exchange.*)

Local Hæmostatics.—"Hæmostatic agents which are applied to the whole surface of the wound, may be divided into two classes, according as they promote or impede the accomplishment of union by first intention. Of the latter class are the ancient methods of searing with a hot iron, cutting the soft parts with a red-hot knife, dipping the end of the stump in hot pitch or oil, strewing the raw surface with astringent or escharotic powders, binding agaric or sponges tightly against the bleeding surface, etc. etc. To these may be added the plans recently put forward of dividing the soft parts by the galvanic cautery,* or by the extemporaneous ligature, (ecraseur;†) also, the employment of powerful styptic solutions of sesquichloride of iron, etc. Some of these methods may be adopted with advantage in certain cases of secondary hæmorrhage, but they ought never to be used in any case in which union by first intention is possible.

"Of the local applications which may arrest hæmorrhage without impairing the chances of speedy union, the free use of cold water and the exposure of the raw surface to the action of the air, are among the most important. Dashing or sponging the wound freely with cold water causes the immediate contraction of the mouths of the smaller vessels; but bleeding is very apt to recur whenever reaction takes place. The use of cold applications, therefore, to be effectual, must be continued for a considerable time, and great care must be taken to protect the patient from the discomfort of cold and wet bedclothes. The exposure of the open wound to the air acts in part, doubtless, by the cooling effect of evaporation, but its chief efficacy is probably due to the stimulating action of the oxygen upon the tissues. A wound thus exposed for a time to the air, is very much less likely to bleed after it is done up than if treated by cold applications. The formation of clots between the opposite cut surfaces, which is one of the greatest obstacles to their early union, is prevented, and the dressings, when once applied, seldom require to be disturbed for several days. If sutures are used, they may be inserted at the time of the operation, while the patient is yet under the influence of chloroform, and loosely knotted together until the time arrives for finally adjusting them.

"The local use of strong alcohol as a styptic has been lately advocated in France. When used of the strength of 36° Cartier, (=89·6$^0_0$,)

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* Middeldorpf. † Maisonneuve.

it coagulates the albumen on the surface of the wound, forming a grayish-white pellicle, and stops the hæmorrhage from the small vessels. It is also said to hasten the secretion of plastic lymph and to prevent diffuse suppuration by coagulating the albumen of the cellular tissue. At first view, it would seem that the contact of so powerful an agent with a fresh wound would almost of necessity cause the death of its surface, and thus entail a more or less tedious suppuration. Experiments have proved, however, that strong alcohol may be applied to fresh wounds without exciting inflammation, and it seems indeed to favor union by first intention, by thoroughly arresting the hæmorrhage from the small vessels. Alcohol is, moreover, powerfully antiseptic, and offers many advantages over the solution of hypochlorite of soda as an application to sloughing and bleeding sores."—(DR. JOHN GREEN, *Boston Med. and Surg. Journal.*)

"*On an Improved Mode of Using Refrigeration as an Anæsthetic and as a Remedy.* By JAMES ARNOTT, M.D.—It is now, I believe, universally admitted that, by the application of intense cold, pain may be certainly prevented in the numerous operations in which the incision is confined to the skin and the superficial textures; and few will dispute that, in these operations at least, its perfect safety gives it a great advantage over ether or chloroform. But the general opinion is, that it is more troublesome to use it than chloroform, and that it is more apt to fail in producing anæsthesia from some oversight or error in the application. This idea has prevented many from employing refrigeration, except in cases where the patients have objected to chloroform, or where there was more than the ordinary risk from its use. In hospital practice, the longer time occupied in effecting congelation has made chloroform be preferred in almost every case. In consequence of this, many deaths have occurred from the administration of the latter in the most trivial operations—in the extraction of a toe nail, the opening of an abscess, or the cutting off a wart.

"There is nothing singular in this objection, arising from the supposed difficulty or trouble in the use of intense cold. Some of our most valuable remedies have only become generally adopted when the mode of administering them has been simplified. Artificial respiration, galvanism, and several measures resorted to in the treatment of stricture and stone, may be adduced as examples. But the most striking instance of this is found in a therapeutical agent more nearly connected with our present subject. Although sulphuric ether, when properly employed, is not inferior as an anæsthetic to chloroform, the greater trouble attending its administration would have probably very much lessened the use of etherization, had no easier mode of effecting it been discovered. Chloroform is a more dangerous agent than ether, and has on this account been banished from some of the principal hospitals in North America and France, yet so much valued by the great majority of surgeons is its greater ease of administration, that the honor of discovering this means of facilitating anæsthesia has been almost as keenly contested as that of the great discovery of etherization itself.

"Congelation has hitherto been generally produced by placing the freezing materials on the part to be benumbed. In order to insure success, care must be taken that the ice shall be well pulverized and rapidly mixed with the salt or salts constituting the frigorific. The mixture

must be applied by means of gauze, or some other thin permeable material; and when the part is not in a horizontal position, a gutta-percha cup fitted to it may be required to keep the frigorific in contact with the skin. Now, all this trouble may generally be avoided by the adoption of an expedient similar to that employed in the therapeutical application of extreme heat. It is rarely the case that a burning substance is applied directly to the part; instead of this, an iron, which has been previously heated in the fire, is used. In a similar way, an iron, or a brass, or copper implement, of appropriate shape, may be previously cooled in a freezing mixture, and applied with the greatest accuracy to any accessible part in whatever position this may be. A small, flat, laundry iron, which may be used for pounding the ice, will also answer in a great many cases as the refrigerator. If an extensive or continued refrigeration is required, two such irons, immersed in a semifluid mixture of two or three pounds of ice and salt, may be necessary to replace each other, just as two hot irons are often required for cauterization.

"When a metallic body of this description has been cooled to below zero of Fahr., it will often arrest the circulation of the skin the instant it touches it; but more frequently it must be moved and gently pressed on the part for a few seconds, so as to bring a continuous fresh surface in contact with it while the blood-vessels are compressed.

"Another expedient, partly resembling that just described, and partly that hitherto in use, consists of a thin metallic bottle (tinned iron or aluminium) completely filled with the frigorific mixture. A Florence flask will sometimes answer the same purpose.

"I think the above description is sufficiently minute, and that the surgeon, by the adoption of this method, will no longer have to complain of difficulty or trouble in using congelation, either entirely to prevent pain in minor operations, or to prevent the more acute portion of pain, or that arising from incision of the skin, in operations of a deeper or severer kind. In the preface to his work, entitled 'Ten Years' Operative Surgery in the Provinces,' Mr. Prichard states, that he 'refuses chloroform in the lesser operations wherever ice and salt can be conveniently applied.' By means of the metallic refrigerator almost every part will be accessible. The complaint made by Messrs. Perrin and Lallemand in their recent and very complete work on 'Surgical Anæsthesia,' that congelation has been too much restricted to certain operations, will probably, by this improvement of the processes, have no longer any foundation; but that, if I may be allowed to use the words of these writers, 'on peut prévoir le moment où, grace a la réfrigeration, l'anesthésie pourra être étendue à toute la pratique usuelle de la chirurgie.' Page 651.

"It is not, however, in being a safe anæsthetic that the principal value of congelation consists. I am anxious to see it more generally employed as a prompt and certain antiphlogistic in all accessible inflammations. The extraordinary remedial powers of congelation in the various forms of chronic rheumatism, which I have related in former publications, may be attributed partly to its anæsthetic and direct antiphlogistic virtues, and partly to the peculiar counter-irritation which it excites. As promptness of action is eminently characteristic of this remedy, it would be especially serviceable in many of those inflammatory and painful diseases to which soldiers and sailors are liable, and which are at present cured with so much difficulty as to render them long unfit for their duties. Among these may be reckoned sprains and inflammatory affections of the joints,

wounds, irritable ulcers, headache, lumbago, and other painful affections, inflammation of various glands, ophthalmia, erysipelas, and other diseases of the skin.

"Being convinced, from no little experience, that a short application of intense cold, produced by a frigorific mixture of appropriate strength, constitutes a certain and speedy remedy of every accessible inflammation, as well as a means of preventing pain in operations, without the risk of sudden or (which has been much more frequent) consecutive death attending the use of chloroform, I do not deem that portion of my time misspent which has been employed in devising and describing such a simple and easy mode of making this application as may lead to its more general adoption."—(*Med. Times and Gaz.*)

"*Ptyalism from the Use of Toys Colored with Red Pigment.*—A small unglazed cup, colored with red paint, was exhibited to the Western Med. and Surg. Soc. of London, by DR. WAY, from the use of which a child, eighteen months old, had suffered with profuse salivation, with enlargement of the submaxillary glands, sponginess of the gums, fissured tongue, and ulcers with herpetic patches on the external surface of the cheek. A sister of the patient suffered in the same way, but to a less extent. The red paint on the cup gave, when examined, evidence of mercury."—(*Ibid.*)

Plastic Glue.—The following notice of an approved method of securing accurate casts of such irregular cavities with small outlets, as the interior of skulls, occurs in a note to an interesting paper in the *Natural History Rev.*, on the Brain of the Siamang, by WM. H. FLOWER, Conservator of the Museum of the Royal College of Surgeons, England. As the plastic compound therein described is of general application for taking impressions, it will doubtless prove useful in dentistry. "These casts are made as follows: The skull being vertically bisected, (unless the calvarium has been removed for the purpose of taking out the brain, when no other incision is necessary,) the small foramina and fissures are stopped with clay, the two halves fastened together, and the brain cavity filled through the foramen magnum with a composition of glue and treacle, liquid when warm, but, when cold, forming a firm material taking a beautiful impression of the surface with which it is in contact, so plastic that it may be pulled out, without injury, from any underhanging depressions in the skull cavity, and yet so elastic that it will immediately regain its exact form. From this a mould is made in plaster in as many pieces as may be necessary, according to the complexity of the form of the object, and out of this mould any number of casts are taken in the usual manner. These casts give a perfect and most convenient working model of the general form of the brain, which, owing to the peculiar softness of the cerebral tissues, can rarely be preserved in the actual specimen. Their utility has especially been insisted on by Gratiolet."

"*Browning Iron and Steel Objects.* By M. SAUERWEIN.—Gun-barrels and other objects in iron and steel are browned, either to improve their appearance or to preserve them from rust, by giving them at first a thin but entire coating of oxide of iron. The following process is successfully employed in Prussia for browning steel barrels:—

"Dissolve two parts of crystallized ferric chloride, two parts of butter of antimony, and one part of gallic acid, in the smallest possible quantity of water, (about four or five parts;) with this moisten a sponge or cloth, and rub the object to be browned. Leave it to dry in the air, and repeat the operation several times. Then wash with water, dry, and rub with boiled linseed oil.

"Objects browned in this way have a very agreeable dead-gray appearance, and the shade deepens according to the number of times the operation is repeated. It is essential to the success of the operation that solid butter of antimony should be used—that is to say, a chloride of antimony containing as little free hydrochloric acid as possible."—(*Dingler's Polyt. Journ.* and *Chemical News.*)

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Silicates.—The *Chemist and Druggist* states that MR. H. ELLIS has obtained a patent in England for "improvements in the manufacture of compounds of silica, and in the application of certain compounds of silica to mineralize woven fabrics, paper, and paper pulp, to harden and preserve stone and cement in the production of artificial stone and paint, and in the production and glazing of porcelain and such like manufactures.

"To manufacture compound silicates, the patentee first precipitates the compound silicates out of solutions of silicate of soda, or of potash, by means of solutions of any of the salts of the metals, or of the earths. He then strains and washes the silicates so obtained; and while recently formed, or in the gelatinous state, he redissolves them in as much as may be sufficient of a solution of silicate of soda, or of potash, or of both. If the silicates have been allowed to get dry, he heats the mixture up to the boiling point to facilitate their solution. All gelatinous silicates, however obtained, may be made soluble in the above manner, and by addition of carbonates of soda or of potash. Solutions of the boro-silicates, phospho-silicates, and chromo-silicates he obtains by mixing saturated solutions of borate of soda, or chromate of potash, with an equal quantity by measure of solutions of silicates of soda, of potash, or of both, of about 1·2 specific gravity, and then precipitating by means of solutions of the metallic or earthy salts, and washing and redissolving the recent precipitates so obtained in the manner described. All the above compound soluble silicates may be reduced by evaporation into a gelatinous state, and preserved for use in that state in air-tight vessels."

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"*Change of Form in Metals by Irregular Cooling.*—LIEUTENANT-COLONEL H. CLERK has communicated to the Royal Society some curious experiments on this subject. It appears that a wheel had to be shoed with a hoop tire, which was required to have a bevel of about three-eighths of an inch, and one of the workmen suggested that this could be accomplished by heating the tire red hot, and immersing one-half its depth in cold water. This was done, with the predicted result, the part out of the water being reduced in diameter. A series of experiments followed, with similarity of action, the cylinders always exhibiting a contraction above the water line, followed, if they were sufficiently high out of the water, by an expansion corresponding to that below the fluid. The explanation given is, that the parts under the water cooled quickly, and those above it slowly. If no cohesion had united the two parts, both would have ob-

tained the same diameter, one first, and the other afterward; but as the cohesive power of cast-iron, or other metal, is great, the under part tends to pull in the upper, and the upper to pull out the under. In this contest the cooler metal, being the stronger, prevails, and so the upper part gets pulled in, a little above the water-line, while still hot. But it has still to contract in cooling, and this it will do to the full extent due to its temperature, except so far as it may be prevented by its connection with the rest.—*Proceedings of the Royal Society.* The name of the workman who made this fundamental discovery ought to have been mentioned with due honor. He is a more important person in the transaction than Lieutenant-Colonel Clerk, who has taken care to secure the credit of what he has done in it. Science knows nothing of social vanities; the best observer stands the highest, whatever his rank."—(*Intellectual Observer.*)

"*Case-Hardening.*—A thin skin of steel is given to forged articles of wrought-iron by the process called case-hardening. The old method of case-hardening portions of gun-locks and other articles forged of wrought-iron consisted in placing them in a sheet-iron box and surrounding them with a stratum of old shoes, hoofs of animals and bone-dust, and sometimes bone-dust was used alone. The lid of the box was tied down with a wire, luted with clay, then placed in a clear fire and heated to redness as soon as possible, at which temperature it was kept for about an hour. The box was then lifted from the fire and its contents immersed in cold water or oil.

"The new method of case-hardening consists in using the prussiate of potash—a salt composed of carbon and nitrogen, (C2N.) It is employed in a different manner from the old method. The article to be case-hardened is heated in an open fire to a dull red heat, then rubbed upon the prussiate of potash, reduced to powder and placed on the hearth of the furnace, then returned to the fire, heated for a few moments, and plunged into cold water or oil. Another method, said to be superior to this, consists in applying the prussiate of potash, made into paste with a little starch and water, to the article that is to be case-hardened, then allowing the paste to dry, heating the article to a dull red heat in the fire, then plunging it into oil or cold water. The skin of steel produced upon iron by case-hardening is about $\frac{1}{16}$th of an inch in depth. As nitrogen forms part of all the substances that are employed in case-hardening, it is believed by many persons that its presence is not only required to form steel, but that a small portion of it enters into the composition of steel."—(*Sci. American.*)

"*Cleaning Silver-plated Articles.*—White metal articles electro-plated with silver are now very common, and great care is required in cleaning them when tarnished. No powder must be used for this purpose which has the least grit in it, or the silver will be scratched and soon worn off. The finest impalpable whitening should be employed with a little soft water in removing the tarnish. They are next washed with rain water, dried and polished with a piece of soft leather, some rouge powder or fine whitening, then finally rubbed down with the hand, which forms a most excellent polisher."—(*Ibid.*)

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ORIGINAL COMMUNICATIONS.

PRACTICAL HINTS.

BY J. D. WHITE.

Concussion of Front Teeth.—Sometimes alveolar abscess follows very soon after the death of the pulps in those cases in a much shorter time than is usual in cases where there has been no contusion; the injury of the parts seems to favor its formation. It not unfrequently follows before the teeth are apparently ready to plug. This should not intimidate the dentist in holding on to the cases. Give ample time for them to recover; many teeth are sacrificed because the parts look badly.

Case 1.—Sixteen years ago a young gentleman called to see us to get the two front incisors of the upper jaw extracted; the median angles of the cutting edges of both had been broken off by a blow, but not sufficient to open the pulp cavities. Both teeth were dead, the gums much tumefied, and pus discharging apparently all around the necks of the teeth between the margins of the gums and the teeth. They were so loose that, perhaps, the weight of an ordinary forceps would have displaced them from their sockets. We objected to extracting the teeth; the gums were lanced freely about three-eighths of an inch above the margins, and rather large tents of cotton placed in to prevent the wounds from healing up and to promote the discharge of the pus in that direction, and divert it if possible from escaping between the gums and the teeth. In the mean time we drilled both teeth open at the fractured angles, opening the pulp cavities freely to promote as much as possible the discharge of pus in that direction; also keeping creosote in the pulp cavities as a depurative, as we believe it to be the best thing as an alterative in such cases. We changed the cotton in the gums and in the pulp cavities every two days, and in a very short time we had the satisfaction to see the discharge cease around the necks of the teeth, and the gums unite to them in a normal manner. After the tumefaction of the gums had been reduced, which was considerable at first, and the teeth became firmer in

their sockets, we plugged the pulp cavities as firmly as possible, left the tents of cotton out of the gums, and the openings healed up. Ten years after, we saw the teeth; there was no looseness of them, no sponginess of the gums, nor any appearance of a return of abscess.

Case 2.—A Miss, about thirteen years of age, fell, on going up stairs, and struck her front teeth against the edge of a step, one year since; bruised the lip considerably, but did not know of any other injury for several days, when one of the front teeth became painful in contact with heat and cold, and somewhat sore. The aunt brought her to us for consultation; we found that the tooth had an enamel crack in a direct line across the middle of the tooth corresponding to the body of the pulp cavity; in every other respect the tooth was sound. On placing a mirror on the back part of the tooth, it presented a reddish hue. We let the case go for a few days, directing the use of cold water to the parts; but upon seeing the case again, the redness had somewhat disappeared, and the tooth became slightly purple. We drilled into the pulp cavity; on the posterior surface the pulp was partly dead, but it bled freely; we let it go until the bleeding subsided, when we destroyed the balance with the arsenical paste. The patient did not return from some cause for about three weeks, at which time pus was oozing out from around the neck of the tooth; we lanced through the gum above the margin, introduced a tent of cotton, washed out the pulp cavity, kept creosote in, and in a few days the discharge ceased around the neck of the tooth. The parts soon became healthy, and the tooth became firm in the gum. We plugged the pulp cavity, and the fistulous opening healed up and has not yet reappeared.

We adopted this treatment for those kind of cases of abscess without knowing of its having been practiced by other operators. If it is practiced, it ought to be more widely known, as we hear of teeth having been extracted under such circumstances as incurable. We do not consider it as any more than what the common sense of any operator ought to suggest; but as it is not done by all, we believed it to be time and important to make an article on the subject. These cases look more formidable than they really are; all it requires is courage and a little time. Teeth are extracted too hastily as a general rule.

(To be continued.)

ABNORMAL DEVELOPMENT OF THE TEETH.

BY E. WARE SYLVESTER, D.D.S.*

Read before the American Dental Convention, Saratoga Springs, Aug. 1863.

WHEN the architect designs to erect an edifice which shall not only be ornamental, but a lasting monument to his name, he is extremely careful to excavate deep and lay the foundation beyond all chances of disturbance,

in order that the edifice in all coming time may remain unchanged and unchangeable. So the physiologist, if he would build a theory which shall stand the test of the most thorough scrutiny and investigation, must "begin at the beginning," and having so commenced, the causes of the disturbance in nature's laws can be often plainly discerned.

When God created man in His own image, we suppose him to have been perfect in his physical organization, and that Cain and Abel, at maturity, had well-formed dental arches, with full, round teeth inherited from their parents. In contrast with these mouths, let us take from one of our cities and from the class denominated the "upper ten" a lad of sixteen and mark the difference. With an arch terminating almost in a point in front, the bicuspids on the opposite sides of the arch within about half an inch of each other, some of the upper incisor teeth falling within and some falling without the arch of the lower jaw, with an occasional space where a tooth ought to have been, and a half dozen nearly eaten up with gangrene, and we have the reverse of the picture in part.

True it is that some time has elapsed since Cain and Abel were perfecting their second dentition, but somewhere between that time and the present these changes have been produced, either suddenly or gradually. We are inclined to the gradual theory, although we by no means intend to countenance another theory of the gradual progression of the human species through their illustrious ancestors the monkeys. Nor has this deterioration been universal. Most of the Teutonic race as they land on our shores have well-developed dental arches and perfect teeth. The aborigines of our own country, where they have been uncontaminated with white vices and white cookery, have perfect teeth. Some years since we passed a day, with several assistants, in opening some of those vast mounds on the oyster coast of Georgia where the aborigines had been buried by thousands, and where the teeth, and often the alveolar process, were in a perfect state of preservation. In the examination of thousands of teeth we did not find a single one affected with caries, and but a single case of disease, and this specimen is now in our collection, and this disease was apparently produced by wearing down the crown of the tooth until the pulp of a molar was injured, and this had produced suppuration at the apex of the fang.

We come then to the conclusion that the full dental arch and sound teeth are natural according to the designs of the Creator, and that a contracted arch and diseased teeth are the results of a series of violations of nature's laws.

We will notice then in the present paper five of these violations which have, in part, produced these disastrous results.

1. *Parental Influence.*—"Like begets like." "As is the father so is the son." These are truisms which have long since passed into proverbs, and are generally admitted. If both parents have well-developed mouths, and the

child is reared in accordance with nature's laws, it will have similar masticators. If one of the parents has a defective dental apparatus and the other perfect, some of the children will inherit the "like" of the one, and some of the other, and often the two mouths will seem to be blended in the offspring. We suppose that all have seen cases like the following. The mother's mouth articulated in the usual manner, the upper incisors closing in front of the under; the father's antagonizing perpendicularly. Now it often occurs that the children of these parents will seem to have the right side of the mouth resembling the one parent and the left resembling the other. From the median line as a point, the two sides of the mouth are dissimilar, forming a difficult case to regulate and put in perfect shape.

Defective teeth on the part of one or both parents seem to follow the same law that "like produces like."

2. *Gestatory Influence.*—When a successful intercourse has been enjoyed between parents, and the womb impregnated, it would seem to be in accordance with the laws of our being that the husband and prospective father should forego his marital rights and privileges, and leave the prospective mother without future excitement, in order that she may perfect the embryo being committed to her charge. But we have every reason to believe that this is far from being the usual course, and that frequent sexual connection is indulged in, resulting in enfeebling the germ already commenced, and, as a natural consequence, preventing that full development which nature requires.

3. *Improper Diet.*—We now picture from the "upper ten." From the time that the infant first makes his voice heard, to the age of maturity, there is almost one constant violation of nature's laws. Instead of allowing the mother's milk to cleanse the intestinal canal of the infant, he is immediately dosed with molasses and water, or some one of the thousand specifics which cruel nurses have invented.

The mother, too enfeebled by previous sins, it may be, has no milk, and the aid of the cow and the confectioner are invoked to assist in rearing the dear little sickly infant, and the more unhealthy it is the more dear it is, as a matter of course. As soon as the dear little one can swallow, arrowroot and sago, jellies and cream, paregoric and assafetida, wines and custards, salts of tartar and quinine, candy and confections, are all made to play their part in producing an abnormal condition of both the first and second dentitions which are reposing quietly in their own proper places in the dental arch. This same course is pursued, and the nurse with money and little carriage is sent to the baker's and confectioner's to get something which the dear little one can eat, his appetite is so poor. The bread, too, if perchance he is so vulgar as to eat any, must be from the finest of the wheat, white and beautiful, with all the phosphate of lime or bone-producing material, already extracted from it and given to the dogs and

horses. Do you wonder that such diet produces an abnormal development of the teeth?

4. *Impure Air.*—Most persons do not seem to realize that every adult person removes the oxygen from and nearly destroys one gallon of air per minute—a child more, in proportion to his size. Hence we find beautiful curtains around our beds, double sashes in our windows, cotton in all the crevices of the room, listing on the doors, and every contrivance imaginable to keep out the pure breath of heaven; with the air-tight stove, and the flaming gas burning up the air, and several persons in the room breathing it up, few ventilators are introduced, and the life-giving, teeth-forming pure air gets access to the infant and the youth only by stealth. Is it a wonder that gas-tar and nitrogen, the stench from feather beds and decaying horse hair, do not produce natural, healthy teeth?

5. *Want of Exercise.*—We are still in the region of Fifth Avenue. At first the delicate little infant is carried on a pillow by the attentive nurse in slippers, with soft and measured tread. In due time he is transferred, on downy pillows, to the beautiful baby carriage with steel springs, (the old cradle is an institution of the past, it shook the little one too much,) and on the soft Wilton carpet it is very gently drawn back and forth by its attentive nurse, and sometimes, at a year or more, it is drawn on the smooth flagging of the street, or carefully driven by Patrick in a curtained carriage, with walking horses, around the square, and when school days come, by the same conveyance it is carried to the very select school where plebeian feet or heaven's pure air seldom find admittance.

You tell us this picture is over-drawn. It is true to the life. There are similar pictures with less coloring, just as there are some children with good mouths, medium mouths, bad mouths, and very bad mouths.

In conclusion, we remark, give us two healthy parents with full dental arches and robust constitutions, let them obey with strict fidelity the laws of our physical being, let the infant be nursed, the youth fed and clothed, and aired in accordance with nature's laws, place him on the pony, (a live, trotting pony,) put him in the garden with the trowel and the spade, let him get a little "*real estate*" on his hands, in his boots, (if he has any,) and even on his face. Put him in Dr. Lewis's training, with light clubs and pure fresh air, and we will guarantee a dental arch which will compare favorably with that of Noah or Methuselah.

PLASTIC FUSIBLE METAL FOR FILLING TEETH.

BY B. WOOD, M.D.

Read before the American Dental Convention, Saratoga Springs, Aug. 1863.

GENTLEMEN OF THE CONVENTION: Allow me to call your attention to the improved form of the new fusible metal discovered and patented some

time since, as now applied and used for the purpose of filling teeth. It is designed as a substitute for gold foil, where economy is an object, as well as for the inferior materials. For this it is believed to supply a very important desideratum long felt to exist by the dental profession and the community. It forms solid and impervious fillings which so perfectly adapt themselves on introduction to the sinuosities and walls of dental cavities as to preclude the admission of air or moisture at every point. At a moderate heat, but little higher than that at which hot drinks are taken into the mouth, and yet not low enough to be the least affected by them, it is rendered soft and plastic, and can be moulded into any shaped cavity, or built out from defective teeth, restoring their form and usefulness. Upon introduction into a tooth it becomes at once hard and solid, and therefore is fit for immediate use in mastication, and not subject, like amalgam or "cement" plugs, to rub off by the attrition of food or to crumble out. It contains no mercury, nor is it allied in composition or qualities to amalgams; and it is exempt from the important objections urged against these preparations. Although liable to cloud upon the surface in some mouths, this is but slight; generally little more than a dull, opaque appearance, hardly amounting to a perceptible change of color. In no case have I found it ever to blacken on the surface as amalgam and also silver plate usually do; and it never discolors the tooth or contiguous portions of the dentine as amalgam so uniformly does. Being much harder than solid block-tin, or nearly as hard as pure gold, it will outwear any tin plug, however perfectly consolidated, as well as plugs of gold foil imperfectly condensed; while it requires no force of pressure for its introduction.

These qualities render this material an object of no slight interest to dentists, as well as to those of the community who have defective teeth which they wish preserved in the most effectual as well as most economical manner. I would respectfully refer those who desire to acquaint themselves fully in regard to the history and nature of this discovery and kindred subjects to the scientific and professional journals, only designing to draw attention here to the value of the material applied and adapted to the purpose of filling teeth; referring in particular to the following sources of information: U. S. Mining Journal, May 26th, 1860; Silliman's American Journal of Science and Arts, Sept. 1860, and March, 1862; Scientific American, Nov. 17th, 1860, and April 5th, 1862; Journal of the Franklin Institute, Aug. 1860, and Jan. 1861 and 1862; or the Annual of Scientific Discovery for 1861, etc. See also the dental journals, 1860–1863, *passim.*

In the Dental Register of the West for 1862 and 1863 may be found a series of papers on "Metals and Alloys," in which, among others, the component metals of this material are particularly described. The chief design of these papers was to give the results of actual experiment, omit-

ting, except so far as was necessary for connection and a certain degree of completeness, such matter as was accessible from the ordinary sources. Although written under disadvantages, and necessarily incomplete in themselves, it is believed that, in connection with what may be gleaned from the books, they will add no little to the common stock of information in regard to the nature and mutual relations of a class of elements which appear to have been the most neglected in the very particulars which give them the greatest practical interest.

I am aware that some undervalue metallurgic study and research as not practical. But even if it were not, ought it not be held in some repute for its own sake as an important branch of science by a scientific profession? Nor is it without practical bearing. No branch is more practical to *all* the arts, and especially our own. Those who would ignore it as of slight valuation, can do so only because they have yet to learn the *alphabet* of the science upon which they assume to pronounce judgment. And I will venture that professional teachers who treat this branch with apathy or derision, will prove, upon critical inspection, to be not the most trustworthy in other branches. Its practical importance could be illustrated by a thousand instances coming home to us daily. But this would be quite too wide from the object of this paper, which is only to draw attention to one of the additions which metallurgy has made to the resources of practical dentistry.

If the discovery of the new fusible metal was sufficient to interest the scientific world, its successful adaptation and application to the purpose of filling teeth ought surely to claim some interest on the part of dentists. Let it not be despised because brought forward by a *dentist.* The scientific world, though long led to despise our fraternity as much as we have despised each other, are beginning to recognize that some good can come out of Nazareth, and to award due credit for it, despite their prejudice; and but for the low jealousy still too prevalent among us, which grudges a just award to our professional brethren, we should soon win that respect to which the profession is justly entitled. But, if to be honored one must honor his own household, it becomes us as a body to receive with consideration whatever comes from a professional brother, *because of its source*, until it shall prove unworthy of that source. Let it be no longer said that we evince more confidence and fairness toward offerings from the veriest ignoramuses outside of our own pale than toward those proposed by our own members, even though presented by men whose whole lives in the service of the profession, public and private, afford not a solitary ground for distrust of their integrity, and whose qualifications are well enough known to their compeers, if they had the generosity to avow it.

For what I have to offer, I only ask a fair hearing and fair examination due from man to man. I certainly should not have proposed it if I

had not been well assured that it would prove of value. Those who have tested it most thoroughly know that the claims upon which I proposed it fell far short of its merits. Its suitableness and applicability have been demonstrated in cases not at first contemplated, and the field of its usefulness greatly extended. Every dentist who has learned to use it has spoken well of it, so far as I have been able to hear an expression of opinion.

The Dental Register of the West, comparing the Plastic Metallic Filling with tin foil, (the best substitute for gold hitherto used,) says, Sept. 1862:—

"We think this alloy quite as good in any respect as tin, and in some, perhaps, much better. In the facility with which it can be introduced and manipulated, it is certainly much superior to tin foil, and then it is in a solid mass when introduced."

In a subsequent number of the same journal, (which see for valuable suggestions as to the manner of applying the "Filling," too lengthy for citation here,) the editor remarks:—

"It can be used in any place where tin foil can, and in many cases where it cannot. For filling up large cavities in molar teeth where the use of gold is not admissible, it is the best preparation we have. * * * It can rapidly and readily be built into any required shape. We have, in a number of cases, used it for temporary filling, in the treatment of sensitive dentine, and particularly in the treatment of exposed nerves, when the object is to protect an exposed point till new dentine is formed, or till the conditions are so changed as to admit a permanent filling."—(*Dental Register*, Nov. 1862.)

The uniform expression of dental practitioners skilled in the use of the material is to a similar purport, if I felt at liberty to cite them.

But I may be allowed to refer to Prof. Taft, from whose journal I have quoted the above, well known as the author of our standard text-book on "Operative Dentistry," and one of the most accomplished operators with gold foil in the West. Referring to the Plastic Metallic Filling, in a letter dated Oct. 19, 1862, he remarks:—

"I use this far more than I have used anything of the kind for ten years. It will certainly be largely used by those who make cheap fillings."

At a later date, April 15, 1863, Prof. Taft writes: "It is without all doubt the best thing except gold yet known for filling teeth. I am better pleased with it than ever; many are using it from my suggestion, and all are pleased with it so far as I know."

Dr. Atkinson, of New York City, our pioneer in the higher branches of the profession, theoretically and practically, well known for his remarkable success in surgical treatment and for his magnificent fillings with gold, his favorite material, writes April 22, 1863, as follows:—

"I have been using very cautiously for the last year your Plastic Metallic Filling, which I am happy to say suits me next best to gold for preserving decayed teeth. It must come into very general use so soon as known."

Again he says: "I look upon it as a great blessing to the poor classes of those having decayed teeth."

Dr. J. S. Wood, of Lansing, Mich., late of Albany, N. Y., where his reputation as a dental practitioner for twenty-five years, and his great success in the use of this material the past year, have so many witnesses, and who, it is due to say, is the inventor of the most useful form of instrument yet constructed for applying the metal, recommends it as "an article vastly superior to anything except gold for filling teeth, and in many cases superior even to gold."

To add anything further from competent judges yet heard from, would be only to reiterate the same facts in nearly the same language; but so far seemed fit to place on record, since each of those referred to has done much to extend or to facilitate the applicability of the material of which he speaks.

For my own part, although satisfied of its merits before proposing it, I have been content to leave them to be gradually disclosed by others. But I feel that I ought not *withhold* the facts after such corroboration. As an earnest of its capabilities and the estimate set upon it so far as already known to the profession and community, I may mention that competent operators are now *building out entire crowns of teeth* with it; for which I am informed that in the City of New York the best skill commands ten dollars and upwards for each case. An article with which such results are capable of being achieved is surely worth being made known.

In view of objections on the grounds of its being "a patent," so benevolently urged by parties engaged in the manufacture, sale, and use of other materials with which it comes in competition, I beg to say, that although patented, (and with a view to some ultimate remuneration, not to mention higher considerations which will appear in the sequel,) yet I have not up to the present time required any fee for the right to use it, nor ever charged one dime for instructions. On the contrary, purchasers of the material to an amount sufficient for initiatory trial and practice with it—or one ingot of $\frac{3}{4}$ oz. weight, and sufficient for 100 plugs, at the cost of $2—have been furnished free of charge with a grant to use it in their office practice, protecting the holder ever after from interference on the part of subsequent licensees. Of course these grants do not confer any exclusive privileges to the detriment of others, nor the right to manufacture and sell the material; that is to say, they benefit only *dentists*, in their ordinary sphere of business, and not manufacturers and dealers.

Although this course is inconvenient to myself and not likely to be

taken advantage of by the majority for whose benefit it was adopted, it will still be pursued for the present to afford all to whom it was offered a fair opportunity to profit by it, when resort will be had to the customary plan of issuing regular licenses with a commensurate fee affixed. Indeed, to save myself, I should have to do this or raise the price of the material which in itself will not compensate the time and expense involved. Of the two, the plan proposed has the sanction of custom, and is, undoubtedly, the best for all parties. A reference to the facts will make this appear. Although with a few, ingenuity may supply the want of instruction and of suitable instruments, yet the great majority are unable to succeed unless furnished with these at the start. Many, after all that has been said and written, have but the vaguest idea in regard to the material and the manner of using it. I find the most of those who take hold of it resort to very unsuitable instruments, often the most worthless cast-off tool about their office. Failing under such circumstances, and it is a marvel if they do not, they become discouraged and condemn the material. Others, not realizing that practice makes perfect, if not succeeding in a few indifferent trials, throw it one side, or they apply it at an improper temperature and prejudice their patient and themselves the first attempt. A prevalent mistake is that a few operations ought to suffice to acquire its use and demonstrate its utility. Dentists write me requesting samples enough for a few plugs in order to give it a "trial," when, they say, if they find it as recommended they will buy. Those who have learned to work it know very well what would be the result would I comply with all such requests, post-paid. Now the proper remedy for these drawbacks is clearly to fix a license fee that shall cover all costs, and then furnish the material, instruments, and instructions necessary to acquiring success with it, and to prohibit its use to those who will not take the preparatory means of perfecting themselves in its use. This, too, will protect the profession against those who, though naturally more apt to acquire a new art than many confirmed in old modes, yet do not possess other qualifications necessary to the exercise of our profession. It would secure the benefits of the material mostly to competent operators in reputable practice, until the public shall have learned to discriminate between its use and abuse, and to avoid the incompetent.

ANOMALOUS CASES.

BY WM. H. ATKINSON, M.D.

Read before the American Dental Convention, Saratoga Springs, Aug. 1863.

In general surgery and in medicine these have usually been either subjected to routine treatment without practical adaptation, or dismissed as hopeless and incurable.

The history of nearly every advance in surgery has proven that anomalous cases have fallen into the hands of young practitioners or the more adventurous experimenters, who thus instituted new methods and discovered unknown powers of recuperation or toleration in the living system, and thereby established the various improvements which make modern surgery so eminently conservative of life and limb.

Ligatures, amputations by clean cutting and sawing, exsection of bones, nerves, and diseased vessels, rhinoplasty, and enucleation have all had to pass the unwelcome baptism of opposition from nearly the whole corps of surgeons in the field at the time of the introduction of each. Therefore we should not regard it strange, nor evidence of a special perversity, if we are opposed in our humble attempts to enlarge the field of our usefulness in cases hitherto dismissed from the catalogue of curability and left to nature, or more recklessly and ruthlessly torn from their natural habitat for the lack of knowledge how to save and make them continue to subserve the purposes for which they were placed there. Even to this day, in some localities, the obsolete methods are still pursued in every variety of ignorance and misapprehension of the powers of the living system and principles of a surgery worthy of the name.

Probably in no department has stolid indifference and stubborn persistence in mutilations held more complete dominion than in that of what has been technically called "Operative Dentistry."

When any one has the temerity to step beyond the beaten track in practice, he is fortunate indeed if he do not call down upon his devoted head the maledictions of every "respectable" member of the profession for daring to interpret nature in any other sense than the confined one recognized by these self-constituted and self-proclaimed "savans" of the established doctrine which should guide our honorable body.

There are many in the advanced ranks of the profession who owe much more to the inspirations that induced them to depart from the beaten track of authority, when this failed them in the treatment of anomalous cases, than to all the best instructions received from the so-called masters and authorities of the times.

I have been told in confidence of certain methods pursued with uniform success in out-of-the-way cases, which were kept from the light of the journals and confreres for no other reason than fear of ridicule by the reputedly wise among us. There needs no further testimony than this to prove that we as yet have no settled code of doctrine and principles upon which we may all safely depend in ambiguous forms of dental maladies.

All true authority resides in the perception of the fitness of things by the individual. So if any course of procedure uniformly results in desirable conditions, there can be no good reason why it should not be promptly ventilated for the better guidance of our whole cofraternity in

bringing about benign conditions in those for whom we have been employed.

It is in the memory of living men, who are yet in a vigorous practice, when it was regarded as unsafe and anomalous to attempt to fill approximal cavities in molar and bicuspid teeth with any encouragement that the work should prove a lasting benefit. And so I might say of each successive step in the wonderful progress of each branch of improvement in operative and mechanical dentistry. So that, if we were to take into the account and enumerate each operation that has at one time or another been deemed "anomalous" and "unheard of," we should be under the necessity of recounting every operation in the whole range of our specialty, except perhaps extraction and inserting teeth on rude ligatures or pivots.

With the great mass of those who acknowledge and call themselves dentists, all the more difficult and useful operations of permanent utility belonging to our profession would be regarded as anomalous and doubtful; while, on the other hand, we have a class among us to whom nothing is new or anomalous, or beyond their ability to demonstrate instanter, if we take their word for the demonstration. But I do not propose nor hope to enlighten all of the former class, nor to bring but few of the latter to the conviction of their puerility and entire lack of the very first elements of a true success in study and the practice of our noble calling.

I would say that some genius is requisite for the successful management of all cases which are anomalous to us, however commonplace and well defined and completely understood and managed soever they may be by others. The best off-hand definition of "genius" that comes to me now is "present use of your mental powers." The range of breadth, length, depth, and clearness will constitute the differences among *geniuses*.

The time is vividly within my recollection when the whole field of dental science was a void, and cases arising in it for practical treatment were necessarily all anomalous to my perception and power to remedy. So my sympathy is natural, strong, and fraternal for all those in like conditions; and my chief purpose in penning this paper is to suggest the means, the use of which have deprived the majority of operations in dentistry and the surgery of the mouth, of their anomalous character to my own apprehension, that others may be benefited by my labors, under the inspirations which the cases, and the circumstances under which they have fallen into my hands, have afforded me.

I. When an anomalous case is presented, inquire into its nature to the limit of present ability; and if there be no feasible method by which you may benefit it, cast in your mind the ability of others within the range of your acquaintance, and also the ability, in time and means, of your patient to avail himself of the skill you are about to commend to him;

and if, after mature consideration of all the circumstances, you really think he can obtain a better service than you feel able to afford him, take measures to introduce him to the source of the supposed superior skill. But if for any reason he cannot avail himself of your kindly advice, and you *feel* that you *can* improve his condition, set about it with a painstaking and prayerful state of mind, having the *good* of the *patient* as the prime motive in every effort of anxious labor you may have to employ to effect your purpose.

II. Carefully note the circumstances of the case, and how your mind is exercised about it, with every part of the process you institute and the mutations of the whole case in your note-book for reference and further making up a judgment respecting the diagnosis where this is not at the time clear, or noting this and the prognosis for future confirmation or modification as time may prove, and you will be astonished how much more vividly the case will possess your perceptive powers and be retained by the memory, and how marvelously this record will become a focalizing point of facts which indicate the nature of the unfolding case.

III. Communicate the case and treatment to the first dentist you meet without omission or addition, and you will probably be surprised to find that even one whom you had regarded as far from "au fait" in such matters may obviously serve you, and hasten a happy result to the troublesome anomalous case.

IV. In all cases avoid the risk of complicating the case by injudicious and indecisive interference when you have reason to fear you cannot signally benefit it.

Gen. B. presented an anomalous case. It was a left superior second molar completely split antero-posteriorly, leaving the inner cusp and the palatal fang in one part, and the outer half of the crown and the buccal fangs in the other. The canals of all the fangs and the nerve chamber were excavated and filled by holding the two halves firmly together until the welding of the gold kept them in place. A hole was drilled through the largest portion of the tooth, and countersunk at each end, into which a heavy golden bolt, headed to fit the countersink at the lingual surface, and a nut of like shape fitted on a thread on the other end at the buccal face of the tooth. The head was left long enough to seize with a pair of dressing forceps to maintain it firmly in position, while the nut was tightly driven down into the countersink for it, having been secured in the embrace of a pin vice with slide, making the tooth once more a firm unit.

The split was enlarged with broaches and excavators across the grinding face of the tooth and at the approximal margins, anterior and posterior, at which last two points it was beveled at the edges by means of driving a bur, somewhat larger than the broach used to enlarge the crack, down to the margin of the gum, into which the gold was securely welded simultaneously with the progress of filling the slot across the crown, after

which thin files, corundum tape, burnishers, etc. assisted in completing a solid and secure filling which binds the tooth on every side, on which the patient ate without inconvenience from the first.

As before suggested, all cases in the beginning are anomalous to him who is forced to be his own instructor; and hence the very best means of lessening the cases of necessarily anomalous character should be resorted to by all, that there may be less of sheer experiment and more of clear understanding of the basal laws, which indicate not only the possibles, but the probables of what may be safely attempted and successfully accomplished.

These means chiefly consist in a close scrutiny of the doctines extant in books and in minds of the erudite in such matters, which, if consulted with the requisite freedom, fervency, zeal, and frequency, the small among us will soon become great; novices be made wise; the clumsy dextrous; the vacillating and purposeless steady and determined; the contracted and selfish, broad and generous; the contentious and misanthropic, affable, courteous, and fraternal: so that we shall soon see, acknowledge, and practice the necessity of sending to the highest sources of information all who are inquiring the way in which honorably to attain the very first rank in intelligence and capability that can be focalized in one mind. Make tutors and professors all of this class, and there will be no excuse for entering upon the responsibilities of an arduous practice without due preparation and fitness. And the difficulties in the way of success in the shape of anomalies will soon be annihilated by each following the special department that he is most capable to execute with a complete success, thus sweeping as with the besom of destruction all contentions other than the generous emulations that only intensify noble minds and prepare them for higher and more satisfactory rendering of daily duty to profession and people alike, elevating us far above the petty jealousies of low states of skill and association.

PROCEEDINGS OF DENTAL SOCIETIES.

PROCEEDINGS OF THE ODONTOGRAPHIC SOCIETY OF PENNSYLVANIA.

The regular monthly meeting of the Odontographic Society was held in the Philadelphia Dental College, Tenth Street, above Arch, on Tuesday evening, August 4th, at eight o'clock.

Vice-President, Dr. Kingsbury, in the Chair.

Minutes of the preceding meeting read and approved.

The Executive Committee reported the following gentlemen as candidates for membership, and on ballot they were duly elected :—

Active Member.—Henry Townsend, Philadelphia.

Corresponding Members.—Drs. C. P. Fitch, Wm. H. Atkinson, and Wm. H. Allen, New York; J. Taft, Cincinnati, Ohio; Abr. Robertson, Wheeling, Western Virginia; H. N. Wadsworth, Washington, District of Columbia; John Tomes, F.R.S., and Robert L. Hulme, M.R.C.S., London, England; P. Calais, Hamburg, Germany; Jos. F. Vegas, Bahia, Brazil; and Morize Heider, Vienna, Austria.

Several gentlemen were nominated for membership, and their names referred to the Executive Committee.

The following paper, by S. R. Screven, D.D.S., was then read:—

Dental Caries.

Mr. President and gentlemen of the Odontographic Society of Pennsylvania: Having been appointed to read an essay on some subject appertaining to the theory or practice of dental surgery, I shall now endeavor to comply with the requirements of the society, by making some remarks on the disease known to us as *Caries.* Some gentleman at the first meeting of our society, very wisely remarked that this term (caries) was objectionable, as it did not properly convey a correct idea of the decomposition met with in the teeth; but as it is one that is generally adopted I deem it well to continue its use. It will doubtless be admitted by every practical dentist, that this disease is far the most destructive of any to which the organs of mastication are subject, and this fact is sufficient to show the very great necessity of a thorough understanding of its origin and progress.

I regret to say it has not been my privilege to witness or perform many of the difficult, peculiar, and instructive operations, to arrest caries in its destructive nature, that most of the regular practitioners have had to encounter. Therefore the remarks I have to make at this meeting, so far as originality is concerned, are merely suggestive. Caries is a disorganization or decomposition of dental structure, originating in all cases from mechanical, chemical, or physiological causes; by a careful examination, the three causes conjointly may be observed as active agents in the destruction of carious teeth. We may have an imperfectly developed tooth, with the tubuli running into each other so as to form a very weak surface for mastication; consequently, it is liable to be mechanically injured without any undue force, and if so injured, chemical agents are always present and prompt to engage in the decomposition of all earthy constituents with which they come in contact. And to this imperfect development of the teeth may be attributed two-thirds of the demand for artificial dentures. If we regard man as he is, in his nature, perfection is nearly always deficient; and so we have a premature failure. If the teeth are taken into consideration we have a marked illustration of this; and so also do we meet with similar results in every part of the body.

Dr. Jenner's remarks on premature decay of the body are applicable

here, as I believe many of the diseases spoken of by him are attributable to imperfect development. He says "it is common for special parts to experience the decay proper to age; *not events*, but also long before other parts of the body decay. Thus one man is old as regards his scalp, his hair is gray or his hair-follicles have decayed and wasted, so as no longer to perform their function, and the man is bald; in another it is the alveoli which waste before their time; in a third, the heart and arteries; in a fourth, the nervous system. This tendency of particular parts to grow old before due time is sometimes hereditary. Early baldness, early falling out of the teeth, and an early aged look, we all know occur in many members of the same family at about the same period of life. So also we see member after member of the same family cut off about the same age by apoplexy, by heart disease, by asthmatic complaints as they are called. These diseases being the result, in fact, of degeneration occurring at or about the same period of life—the arteries, or the heart, or the lungs having been so constructed originally, as to begin to decay after so many years of ordinary wear; though care may retard, abuse hastens the decay, and so anticipate or delay the term natural to the individual. Men are old, then, physiologically considered, not when they have lived so many years, but when the structures essential to life have degenerated to a degree almost incompatible with the continuance of life."

Another point worthy to be borne in mind is the change in the osseous structure in advanced age; thus we find the bones of an old person more liable to fracture than those of a younger one. This change is as observable in the dental structure as in any other class of bones in man. Those who have been fortunate enough to have arrived at the age of twenty-five or thirty years without ever being attacked with caries of the teeth, are apt to continue through the balance of life free from its disturbance. While on the other hand we notice a large majority in early life with almost every description of decayed teeth, alveolar abscess, exostosis, inflammation of the gums, and a diseased condition of all the organs in general, to continue through life unless the dentist or physician is sought to alleviate the suffering. Some writers maintain that caries is contagious. Dr. Koecker was of this opinion, and probably was led to this conclusion from the fact that decayed dentine will absorb and retain fluids that will act on the sound dentine, producing, as we sometimes notice, approximal cavities. Dr. J. Taft says in reference to Dr. K.'s views, that "the residue of decayed dentine is, in the soft decay, the animal elements, with a slight portion of earthy matter; and decay, in which the gelatinous portion is removed; the remainder is chalk-like, consisting mainly of phosphate of lime. In neither of these is there anything that can possibly operate on the healthy dentine." Some supposed its cause to be internal. Thomas Bell and many other distinguished authors were of this opinion. But the question, I believe, has been definitely settled

that the exciting causes are external, and the predisposing cause internal or external. Predisposing causes are met with in all teeth; some are, however, more predisposed to caries than others—such, for instance, as those of a soft and delicate texture; while others presenting to the eye a yellowish appearance, very opaque and more dense in structure, are much less liable to it. Yet they are liable to a certain extent from their limy composition, which only requires the presence of an exciting cause, if sufficiently powerful, to develop the disease. The character of the disease in teeth of this description would, however, differ very much from those mentioned first. In the tooth of a transparent appearance, with a soft, delicate texture, we would find it bold and rapid in its course; while the tooth less predisposed to the disease could not be so readily affected. Exciting causes, as I have already mentioned, are met with externally chiefly in the form of acids; and these acids, penetrating the enamel, come in contact with the dentine, upon which its effects are soon manifested by a decomposition of this tissue in the direction of the tubuli, destroying layer after layer of bone, until the pulp cavity is reached. During this process the enamel may remain unbroken for a considerable length of time, and only indicating the disease by a dark-brownish spot.

This shell of bone may remain thus until some hard substance coming in contact with it crushes the walls, leaving, where a beautiful tooth once stood, naught but an unsightly ruin for the study of the dentist who would elevate himself and his profession.

Dr. McQuillen, referring to the position assumed in the paper, that persons failing to live temperately and moderately, grow old prematurely, and that the structure and function of the various organs under such circumstances become impaired, remarked that this held with equal force in relation to the teeth; for the same violation of hygienic laws which proves destructive to the soft tissues of the body, exerts a deleterious influence upon the osseous and dental tissues.

Dr. Fitch, directing attention to the view enunciated by Dr. Atkinson before the American Dental Association, "that the expectoration of saliva was injurious to the teeth," said that while some persons might regard this as a visionary idea, he was disposed to give credence to it. When taking into consideration the fact that the saliva contains a large proportion of the phosphates and carbonates of lime, it will be readily conceded that in expectoration valuable constituents demanded by the nutritive functions are discharged from the mouth.

Dr. Flagg said that, although the subject had been very recently entertained for discussion, he was nevertheless pleased that it had again been agitated; the more so that it afforded him an opportunity to question as to whether, as dentists, we were not too much humiliating ourselves by the avowals of ignorance which all seemed willing to admit. He had quite recently stated it to be his conviction that this subject was the one

probably least understood by the dental practitioner; but he wished to so far qualify this as to be distinctly appreciated. He regarded the specialty of dentistry as possibly entitled to rank as one of the best (if not the best) worked up of all the circumscribed emanations from the noble field of medical research, and could therefore regard with much favor the amount of knowledge possessed concerning even the "least understood" department. Thought that while the received etiology of dental caries would compare favorably with that of very many diseases which had for a far more extended period commanded the investigating talent of a much larger number of learned men, that it would also take decided precedence over the knowledge possessed in the direction of epidemic, endemic, and malarious affections; while the treatment, particularly the topical, would show results which contrasted favorably with that of almost any known form of disease. It was true that we were not unfrequently baffled while putting forth our best efforts, local and constitutional combined; but would ask in what direction was it not so? And would add, that when it was conceded that the education of the present day enabled us not only to recognize the same classifying peculiarities which obtained in other destroying action upon different tissues, governed, as they were, so markedly by what was termed "temperament," and which divided caries into the entire range from phlegmonous to erysipelatous, or, as it was termed, from rapid, soft, and light decay, to slow, hard, and dark decay, preparing us to diagnose quickly, prognose correctly, treat satisfactorily, and institute prophylactic measures which reasonably meet the indications, that it spoke well for dentistry and creditably for its practitioners. At the same time, he would by no means be understood as denying that there was an immensity yet to be demonstrated; he gladly hailed every accession of information, every suggestion of remedial application, and every report of obtained results. Would urge upon fellow-practitioners that they should embrace every favorable opportunity for the exhibition of such constitutional remedies as would probably or possibly induce such change as would tend to produce normal functional action where secretion was markedly vitiated, and to subserve the purposes of bone nutrition where it was evident such increase was required. Desired upon this occasion to add his confirmatory testimony to the statements of Mr. John Taylor, of the London Pathological Society, in relation to the action of the phosphates upon dentition; and would, as the result of his own experience, most heartily concur with him in recommending the employment of the hypophosphite of potash, with its appropriate nutrient, tonic, or stimulant adjuvants, in cases of infantile derangements consequent upon that effort of nature.

Dr. Tees remarked that defective organization was, without question, the most prolific cause of dental caries, and in many cases where this exists, the predisposition to decay was so great that all the efforts of

patients and practitioners to arrest its progress appeared to be of no avail. The recognition of this fact, however, he thought should not prevent the dentist from putting forth every effort to remedy or retard the disease.

Dr. Wardle said he should go a step further on one point than the paper just read, "that man is nearly always imperfect." He believed man, as he is now constituted, *is* always imperfect. In regard to the decay of his teeth, he found, according to his observation, that there were two periods in the life of man during which the teeth were predisposed to decay. The first period was between twelve and eighteen years of age, then about the thirty-fifth or fortieth year for the commencement of the latter period of decay. He found this last development of decomposition far more difficult to arrest. He said he would much rather undertake to save the teeth of the young than of those whose teeth began to soften about the latter period.

Dr. Sill (of Pittsburg) recognized that excessive expectoration, from whatever cause it might arise, was eminently injurious to the human economy at large, on account of the debility resulting from the great drain, and it was possible that the integrity of the teeth might be affected thereby; he was not prepared, however, to express an opinion on that point, as he preferred to give the subject more attention.

Dr. Fitch said that he heartily coincided with the views advanced relative to the general ignorance of the causes of disease, and thought that our knowledge of dental caries, its cause and treatment, was based upon a philosophical and sound basis. The results of local treatment on the part of the dentist left no room for doubt as to the propriety or impropriety of the course adopted; and while the same could not always be said of the general practice of medicine, it was the furthest from his intention to be understood as casting any disparaging reflections by such a remark. In the treatment of dental caries, the dentist should not depend exclusively upon local treatment, but be prepared to, and treat constitutionally when such a course was indicated.

Dr. McQuillen remarked that the *secretions* of the body are divided by physiologists into *recrementitial* and *excrementitial.* Thus the *urine* and *perspiration,* carrying as they do out of the economy materials which are not only not needed, (urea and the nitrogenous compounds generally,) but if retained would induce diseased action, are very properly denominated *excretions;* while the saliva, mucus, bile, and the fluid of the pancreas, on account of the peculiar and indispensable service which they render in connection with nutrition, are regarded as *recrementitial* in their character. Of this group, the saliva plays as important and as indispensable a part as the others. While he was not prepared to say what effect expectoration would have upon the teeth, he fully recognized that very large quantities of that valuable fluid (saliva) were unnecessarily wasted by the universal Yankee nation, much to the physical detriment

of the inhabitants thereof. He believed that nature intended that the saliva should be swallowed. He referred to the rare occurrence of expectoration on the part of ladies, and remarked that it was so unfrequent as to excite comment when a lady did such a thing in passing along the street. He believed that as much or possibly more was known of dental caries than of diseases generally. Too often what is regarded as a perfect acquaintance with and a complete description of any given disease, embraces merely a catalogue of phenomena, an intimacy with symptoms being mistaken for a knowledge of the disease, whose cause and true nature perhaps remain a profound mystery. Many of the so-called *causes* of disease are eminently hypothetical in their character. Much is said about malaria, a something which has a name, but whose real existence remains yet to be demonstrated by the physicist. Where is the microscopist who has seen it with a lens of the lowest or highest power? Where is the chemist who has demonstrated its existence even after the most careful, searching, and protracted analysis?

Dr. Sill did not regard the fact of a person enjoying remarkable health under the use of tobacco, as any argument in favor of the article. He invariably advised his patients strongly against its use.

Dr. Lusson cited an interesting case of a boy on his father's plantation in Cuba, who was in the habit of chewing tobacco and swallowing the saliva, as a remedy for attacks of epilepsy to which he was subject.

PROCEEDINGS OF THE AMERICAN DENTAL ASSOCIATION.

REPORTED BY G. W. ELLIS, M.D.

The Association met at the Assembly Buildings in Philadelphia, at 12 o'clock on Tuesday, July 28, 1863, and was temporarily organized with Dr. Geo. Watt acting as President, and Dr. J. Taft as Secretary.

The Committee of Arrangements then received and examined the credentials of delegates, and presented a report which was accepted and adopted.

In consequence of the absence of the Treasurer, it became necessary to appoint a Treasurer *pro tem.* Dr. A. C. Hawes, of New York, was chosen to officiate in that capacity.

The following delegates, in accordance with the provisions of the constitution, then appended their names to that document, paid the dues, and became invested with the privileges of membership.

Michigan State Dental Association.—Drs. Pembroke S. Grimes, Kalamazoo, Mich.; A. T. Metcalf, Kalamazoo, Mich.; H. H. Jackson, Farmington, Mich.

Brooklyn Dental Association.—Drs. Wm. B. Hurd, Brooklyn, N. Y.; A. C. Hawes, New York, N. Y.; J. H. Smith, New Haven, Conn.; A. A.

Wheeler, Brooklyn, N. Y.; W. C. Parks, Brooklyn, N. Y.; G. A. Mills, Brooklyn, N. Y.; A. W. Allen, New York, N. Y.

New York Society of Dental Surgeons.—Drs. Chas. E. Francis, New York, N. Y.; Thos. Burgh, New York, N. Y.

Pittsburg Dental Association of Western Pennsylvania.—Drs. Chas. Sill, Pittsburg, Pa.; J. B. Williams, Pittsburg, Pa.

Western Dental Society.—Drs. C. W. Spalding, St. Louis, Mo.

Central New York Dental Association.—Drs. J. Westbay, Pittsburg, Pa.; S. G. Martin, Syracuse, N. Y.; S. B. Palmer, Tully, N. Y.; E. M. Skinner, Syracuse, N. Y.; P. Harris, Skaneateles, N. Y.

Northern Ohio Dental Association.—Drs. J. C. Whitney, Salem, Ohio; C. R. Butler, Cleveland, Ohio; A. E. Lyman, Newton Falls, Ohio.

Cincinnati Dental Association.—Drs. Sam'l Wardle, Cincinnati, Ohio; J. G. Cameron, Cincinnati, Ohio.

Odontographic Society of Pennsylvania.—Drs. Jacob Gilliams, Philadelphia, Pa.; C. A. Kingsbury, Philadelphia, Pa.; Ambler Tees, Philadelphia, Pa.; Wm. Gorges, Philadelphia, Pa.; John McCalla, Lancaster, Pa.; W. K. Brenizer, Reading, Pa.

Pennsylvania Association of Dental Surgeons.—Drs. T. L. Buckingham, Philadelphia, Pa.; C. N. Peirce, Philadelphia, Pa.; J. Hayhurst, Lambertville, N. J.; Chas. Moore, Pottstown, Pa.

Pennsylvania College of Dental Surgery.—E. Wildman, Philadelphia, Pa.

Philadelphia Dental College.—Dr. Thos. Wardle, Philadelphia, Pa.

Mississippi Valley Association.—Dr. J. A. McClelland, Louisville, Ky.

Permanent members present: Drs. J. H. McQuillen, W. H. Atkinson, H. Benedict, Geo. Watt, B. M. Gildea, J. F. Flagg, C. P. Fitch, S. Dillingham, W. H. Allen, C. Palmer, J. Taft, Geo. T. Barker, H. A. Smith, and Geo. W. Ellis.

The roll was then called, each gentleman answering to his name.

The election of officers was next in order, and the choice of nominees devolving upon a special committee consisting of one representative from each delegation present, a short recess was granted to effect their appointment, and instructions given for an immediate organization and the presentation of a report at the afternoon session. Adjourned to four o'clock P.M.

FIRST DAY.—*Afternoon Session.*

Reassembled at four o'clock pursuant to adjournment. The Nominating Committee presented the names of candidates, and upon balloting, the following officers were unanimously elected to officiate during the ensuing term:—

President.—Dr. W. H. Allen, of New York City.

First Vice-President.—Dr. J. H. McQuillen, of Philadelphia.

Second Vice-President.—Dr. Wm. B. Hurd, of Brooklyn, N. Y.

Recording Secretary.—Dr. J. Taft, of Cincinnati, Ohio.

Corresponding Secretary.—Dr. C. K. Butler, of Cleveland, Ohio.

Treasurer.—Dr. A. C. Hawes, of New York City.

Drs. McQuillen and Spalding were appointed a committee to conduct the President elect to the chair, who, upon assuming the position, referred to his appointment as a flattering expression of confidence which might, he thought, have been appropriately conferred upon one more capable; he tendered thanks, however, for its bestowal, and hoping to profit by the example of his predecessor, would endeavor to accomplish the faithful discharge of his duties.

Dr. Watt, the retiring President, said he would follow the precedent established, and although provided with no prepared address, would make a few remarks. He had, by some unaccountably curious circumstances, been drawn into the dental profession, how or why he could not say, but he fully appreciated the obligations under which he was placed by the hearty and affectionate welcome extended, obligations which he was able to repay only by feelings of the most profound gratitude for the many favors and indulgences of which he had been the recipient. He thanked the Association for its kind indulgence and his earnest reception; he cared not for the opinions of any one except his colaborers, who could appreciate his motives, and whose commendation he sought to merit. He referred to the growing condition of the profession, and would condemn that impatience which expects too much. No science has yet attained perfection, and he thought that dentistry had already accomplished much more than could reasonably have been anticipated. He dwelt upon the increased knowledge of caries, that most formidable disease which the dentist has to combat, and, judging from the past, believed that time and research would eventually elucidate its nature and causes. He considered that imperfect development and hereditary transmission exerted their injurious effects, and would serve still further to dispel the mystery. Dental science is fulfilling its promises, and nothing could awaken feelings of greater pride than to witness this Association in active and successful operation, promising to become the central influence from whence advancement and improvement will emanate.

Dr. Francis moved that a vote of thanks be tendered the retiring officers. Carried.

The minutes of the preceding annual meeting were read by the Secretary and adopted.

The report of the Committee on Dental Physiology was then presented and read by Dr. Atkinson. The entire physiology of the teeth he regarded as a limitless subject, whose thorough consideration would prove a herculean task; he alluded to the double duty which the teeth discharge—in the mechanical comminution of food, and the divine expression of thought re-

sultant upon a well-fed system, by speech. The influence of perverted habits would, he thought, account for the prevalence of dental disease among the American people; and an exemplary course which would secure good teeth would also insure the enjoyment of good bodily health. This desirable result he considered would be much promoted by the observance of the following rules: Never expectorate, but swallow the saliva; eat regularly, and discard lunches; never eat after weariness and fatigue before first drinking; never eat to repletion; keep the teeth and entire body clean; avoid taking that which is not food; exercise through the day and take uninterrupted rest at night. Those who have never suffered cannot appreciate pain, and consequently with its first attacks, readily succumb. Our physiological knowledge is not perfect, yet profit must be derived from its acceptation and appropriation. Function he described as the combined working of seen and unseen forces. He gave a short and clear explanation of cellular pathology. He regarded the teeth as important structures in so far as they constitute a connecting link between the organic and inorganic world. He entered into an explanation of the functions of dentine and enamel, and believed that a sensitive condition of the latter tissue was both a vicarious and physiological condition. The true type of an organ, he thought, was changed by the adoption of an unnatural function causing the nourishment of one tissue at the expense of another, and thus inviting or favoring pathological changes. He advised in the profession a cultivation of that harmonious and consentaneous action exhibited in the molecular world, the absence of which would bring forth only decayed and effete productions.

Upon motion to determine upon hours of meeting, the following were chosen: from nine A.M. to two P.M., and from four to six P.M.

Dr. McQuillen moved that an invitation be extended to the dentists and physicians of our city and the country to be present at the deliberations of the Association. Adopted.

On motion, adjourned to meet at nine o'clock on the following morning.

SECOND DAY.—*Morning Session.*

Called to order at nine A.M. The minutes of the previous day were read and approved. A consideration of the report on "Dental Physiology," read by Dr. Atkinson, was declared in order.

Dr. Watt was not prepared to unite with the assertion that different textures could perform vicarious functions, and was induced to believe the acceptation of such a view consequent upon an effort of the imagination; and although dentine or enamel might be endowed with nervous vitality, he believed it impossible for them to perform the duty of nerve tissue. He questioned the nervous vitality of enamel, and thought that a painful response was due either to a minute exposure of dentine, or an over-excited and susceptible condition of the more internal structure.

Dr. Moore moved that the Association appoint one of its present members to furnish a full and accurate report of the proceedings of the session.

Dr. Benedict, as an amendment, moved that the Publication Committee be requested to appoint a competent reporter, according to instructions received last year. Adopted.

Dr. Atkinson, to insure a clear comprehension of his statements, entered into an explanation of the positions he had assumed, and to which exception had been taken. He believed that dentine is always sensitive before an entire obliteration of the tubules by calcific action. He said that the file had been advocated and employed with the intention of removing decomposed structure and exciting the physiological action of calcification for the protection of the healthy structure, a result easily attainable under favorable conditions of the system; but its failure from indiscriminate and unscientific application had subjected it to an unjust condemnation. By the term vicarious action, he meant the action of one tissue for another, as calcified dentine assumes the place of enamel, and performs its duties quite efficiently.

Dr. McQuillen asked whether he understood Dr. Atkinson to say that certain conditions would occasion sensibility of enamel.

Dr. Atkinson explained the necessity of a complete circuit to insure sensation, and believed that every molecule of enamel, of nail-tissue, and of tendon was able to feel.

Dr. McQuillen recognized enamel merely as a conductor, by vibration, of impressions made upon it, and cited as an illustration the vibratory nature of the sense of hearing. He took exception to Dr. Atkinson's theory, and believed that the painful sensation induced by touching nails and tendons was due to an exalted sensibility of the surrounding tissues, rather than to a change in the nails and tendons. He indorsed the belief that consolidation of dentine would arrest the progress of caries.

Dr. Spalding referred to the undeveloped condition of a child's organism, and thought that Dr. Atkinson's allusion to the sensibility of enamel in such subjects was most probably owing to the incomplete solidification of that tissue, the intervening soft structure being capable of conduction. He doubted that sensation could be produced in perfect and adult enamel without there first being some chemical dissolution of its substance.

Dr. Flagg remarked the great difference of taste as influenced by the difference of brain organization; his fancy had led and confined his study and investigations mainly in a pathological direction, and he was obliged to plead a very limited knowledge of physiological subjects. Filing he believed serviceable only so far as it removed the presence and contact of injurious substances, and diminished the chances of their further accumulation, and thought that it contributed to consolidation only so far as it accomplished this result and permitted the favorable operation of a pre-

existing tendency to this physiological change. He described the conductive power of the, tubular contents in giving to the pulp information of the advancing trouble, which puts forth efforts to accomplish consolidation; yet, theoretically arguing, he thought this new tissue, from its lower organization, would seem to favor the progress of caries rather than act as a barrier to its advance; where this is the case, he makes a free use of antacids.

Dr. Watt cited the instances of tooth-edgedness which existed long after the loss of all the teeth.

Dr. Flagg was aware that after the loss of teeth or limbs, sensations were referred to the absent members; yet thought that such sensations could never be experienced unless the organs were once in existence.

Dr. Taft could not reconcile the sensation frequently referred to *artificial teeth*, with the theory of enamel sensibility. He said that with the advance of age the pulp deposits new material, or is itself calcified, and in a well-organized tooth, increased effort is induced in the former direction by the progress of disease, erecting as it were fortifications to guard against an enemy's approach. He believed that the file, by stimulating the vital energy of the pulp, might favor consolidation.

Dr. McQuillen had great faith in the vis medicatrix naturæ, and much less in the materia medica, and regarded consolidation of the tubuli as the best means of arresting decay; for in proportion to the increased surface afforded by open tubuli to the action of an injurious agent, is the progress of caries facilitated and hastened.

Dr. Fitch said that every part of a tooth is an organized structure, and consolidation he regarded as the result of a hyper or extra physiological act.

Dr. Butler said that the removal of a pulp changes the physiological characters of decay; and the periosteum, in nourishing the entire tooth, has assumed a vicarious action. He regarded the deposition of secondary dentine as a physiological act.

Dr. Hawes remarked that there was great difficulty in establishing a perfect line of demarkation between the dentine and enamel, and from the continuation of nervous structure a short distance into its substance, the latter tissue might possess sensation.

Dr. Spalding said that he had employed the burnisher to close the mouths of open tubuli, and when heated to assist the mechanical action, he found it to accomplish the result more effectually; he would simply draw attention to these subjects, as he had met with success by such treatment.

Dr. Taft said that enamel is not equally susceptible of sensation at different times. He thought, from the intimate blending of dentine and enamel, that there might possibly be a continuation of nerve tendrils into the latter tissue. He regarded it better to protect than to break down

the ends of the tubuli with a burnisher, hoping that consolidation would ensue under such coverings, as it frequently does under fillings; and with the view of relieving sensibility and favoring consolidation, he would make applications of glycerin or collodion, not as therapeutic, but merely as protective agents, and if indicated would employ, in conjunction with local applications, systemic treatment. He was rather opposed to applications which were chemically destructive.

Dr. Hurd insisted upon a thorough discussion of the subject, and would like to know whether the advocates of sensitive *enamel* ever saw dead enamel which emitted an unpleasant odor?

Dr. Taft thought that the destruction of a pulp diminished the tendency to tooth-edgedness.

Dr. Buckingham referred to the obscurity of the term *sensation*, and believed the property to be resident in the cell. The enamel he believed to be sensitive only by conduction.

Dr. Hurd had determined, as the result of his observations, that tooth-edgedness is most prevalent after the age of fifteen years; and thought that this might be accounted for from the fact that very few over that age are blessed with *perfect* teeth.

Dr. Taft admitted that there are very few if any *perfect* teeth, various degrees existing as we advance from the lowest to the highest type of tooth organization. He referred also to the existence of very obscure differences, and dwelt upon the different susceptibility of different teeth, and of the same teeth at different times. He thought with Dr. Hurd, that tooth-edgedness was most prevalent from fifteen or eighteen to thirty-five or forty years of age.

Dr. McQuillen thought that at fifteen years of age, in a good organism, the teeth were *more* perfect than previously, but believed the exciting causes of the sensibility to be more prevalent. In other words, children at that age indulge more freely their *propensities for articles of diet* calculated to injure the teeth.

Dr. Kingsbury thought that in the teeth of children the nerve fibrils may permeate the enamel to a certain extent, endowing it with sensibility; but the structural changes eventually fill up and obliterate the spaces between the enamel rods, and diminish its susceptibility to external impressions. He was opposed to the application of chemical agents to relieve sensibility, and had never adopted such practice, but would advocate measures calculated to stimulate calcification. He had thought the sensibility owing to the direct action of acids, and had consequently made a free use of alkalies.

Dr. Atkinson thought hyper-sensitive tooth tissue was occasioned by the combined influence of systemic and local causes.

Dr. Spalding makes use of the actual cautery upon sensitive grinding surfaces, and believed it in careful hands an efficacious application. He described his method of manipulation.

Dr. Kingsbury said that when a tooth was sensitive upon the grinding surface, and the pulp nearly exposed, he would advocate its extirpation and a thorough filling of the fangs as the quickest and surest method of securing relief.

Dr. Flagg said that when sensitive cavities refused to yield to any of his numerous remedies, he excavated by the application of acids, neutralizing any portion that might remain before the introduction of a filling.

Dr. Buckingham, in reply to a question of Dr. Flagg's, stated that tooth-edgedness resulted from the internal exhibition of arsenic.

Dr. Flagg referred to the influence of sound in occasioning tooth-edgedness, as instanced in scratching upon a slate, sharpening an instrument, etc., and thought that the existence of this condition could be best accounted for by conduction.

Dr. Fitch said that disease was the result of perverted nutrition; and since a vitiated condition of the system induces a similar disturbance in the teeth, these influences must be admitted to reconcile all the differences experienced. He thought that healthy enamel was rarely subject to tooth-edgedness, unless it was occasioned by some systemic influence; hence the necessity of *both* local and systemic treatment.

Dr. Lyman mentioned an interesting case of a gentleman, about forty-five years of age, who was unable to indulge in anything sour without quickly using sugar to counteract the tooth-edgedness which it produced.

Dr. Taft hoped that experiments would be instituted during the coming year which would tend to elucidate this most interesting subject.

Dr. Sill had suffered much from tooth-edge when a child. He found that on eating an apple termed the Woolman Stripe, the sensation was almost unbearable until counteracted by indulgence in a Pearmain, which he supposed contained a greater proportion of sugar.

Dr. Kingsbury here read an invitation from the Academy of Natural Sciences, inviting the members of the Association to visit at their leisure the beautiful, valuable, and interesting collection of that institution.

A note was also read from Professor Henry Morton, of the Philadelphia Dental College, inviting the members of the Association to witness a series of electrical experiments with Ritche's Rumkoff Coil, at eight o'clock that evening, in the lecture-room of that institution.

The Nominating Committee were requested to appoint gentlemen to fill the respective committees, and report at their earliest convenience. Adjourned to four o'clock P.M.

SECOND DAY.—*Afternoon Session.*

Called to order at four o'clock. The minutes of the morning session were read and approved.

The report of the Publication Committee was presented and received.

The Committee on Chemistry were unable to report, owing to the existence of circumstances absolutely forbidding its preparation.

Dr. Spalding moved that three dollars be fixed upon as the price of the three years' Transactions combined. Adopted.

The report of the Committee on Dental Pathology and Surgery was presented by Dr. Atkinson. He mentioned the necessity of a physiological knowledge for a pathological understanding. Stated the liability of mutation in abscesses. He thought the quotation "He who sleeps dines" was worthy of consideration in the treatment of diseased and debilitated conditions. The simplest form of pathological disturbance in enamel is a mechanical separation of its parts. The second change is chemical, which involves the idea of solution or molecular disintegration, and will go on serially so long as the affinity of the solvent for the molecules is greater than that which exists between them for each other. There is also a state of semisolution and resolidification which is truly pathological, and is displayed in cicatrices and reproduction of cellular and osseous structures. The pathology of secondary dentine he thought of too little practical importance to merit further attention. The pathological conditions of primary dentine are arrested and recuperated by deposition of lime, burnishing, etc.; similar conditions of the pulp call for depletive and antiphlogistic treatment. He impressed the influence of moral treatment. Repair is always the immediate consequence of injury with the existence of a healthy blood plasm. In the destruction of pulps, he applies one-sixth of a grain of arsenic, and removes and fills within one week. He gave a short description of the reproduction of the cranial and maxillary bones. The report was accepted and referred to the Publication Committee.

The Committee on Mechanical Dentistry had no report. But in this connection, Dr. C. Palmer presented some very interesting models, designed to illustrate his method of restoring the facial contour by means of rubber. Before exhibiting these, however, he made a few remarks, in which he attributed the sinking of the features entirely to the loss of the roots and processes. He wished to impress the value of a proper articulation in artificial work, and would direct attention to the *receding* position which the bicuspids should always occupy.

At the close of these remarks, the President read a notice of invitation, requesting the presence of the members at an entertainment to be given at the "Continental Hotel," on Thursday evening, by their Philadelphia brethren.

Dr. Spalding made some remarks on the position of artificial teeth, and referred to the prevalent fault of giving them the horseshoe curve rather than that of a laterally flattened arch.

Dr. Flagg also said a few words upon this subject. He referred to the different character and position of teeth indicated by differently moulded features, and could not attach too much importance to the inward inclination of the bicuspids and molars; for upon the observance of this point the entire utility of the work will mostly depend.

Dr. A. C. Hawes offered the following resolution, viz.:—

Resolved, That the Publication Committee be instructed to give the transactions of this meeting to such magazines as may be willing to publish them, with the understanding that the Association shall be entitled to —— copies, at the expense of paper and printing. Laid on the table.

On motion, adjourned to meet at nine o'clock A.M. on the following day.

THIRD DAY.—*Morning Session.*

Called to order at nine o'clock A.M. Minutes of the previous meeting read and accepted. The discussion of the report on Dental Pathology and Surgery was declared in order.

Dr. Atkinson gave the history of some very interesting cases, and stated the necessity of understanding the nature of the tissue with which we have to deal, and of recognizing when and when *not* to interfere. He thought the reproduction of bone a new process, and would thus classify the forms of disease affecting human bones: first, venereal virus; second, mercurial influence. With regard to the latter, he would say that metallic mercury is entirely inert, a binary or higher compound being necessary to render it capable of effecting a systemic impression. He referred to the necessity of educated touch to discover abscesses. There are two ways by which the death of bone is produced, viz.: First, when bones are dissolved and held within the walls of an abscess; here recalcification may be obtained and a perfect cure established, although the new bone will be of lower organization than the original. Second, necrosis. He believes that a loss of nutrient vitality occurs before the periosteum dies, and exhibited his instruments, termed "enucleating forceps," for separating and preserving this membrane. Venereal virus first attacks the cancellated tissue of bones; and when this condition is known to exist, he evacuates the solution and dresses with iodine and glycerin. When, however, there are mingled malignant products of disease, he uses the officinal tincture of iodine. In milder cases, he mentioned wine of opium as a good application; but in cases requiring prompt and heroic treatment, he would use his sheet-anchor—a saturated solution of resublimed iodine in creosote. He described his method of making applications by means of bamboo strips wound with cotton; he then covers the edges of the orifice with a mixture of 2℥ tannin to 1℥ glycerin by weight, in order to prevent the oozing application from coming in contact with the mucous membrane. When pus is present, he uses the syringe; but the existence of a stringy or ropy plasm he regards as a good sign, and an indication for non-interference beyond the dressing of the outside with tannin and glycerin. He described an interesting case in which the upper maxillary and superior turbinated bones were gone, and the middle turbinated bones much inflamed. He first removed the diseased structure, *obtained a pocket for the retention of the plasma*, and

by applications of his favorite solution of iodine in creosote, succeeded in effecting a very remarkable cure. He gave a description of several minor but very interesting cases.

Dr. Watt moved that, on account of the abrupt termination of the report, the last imperfectly descriptive paragraph be omitted.

Dr. McQuillen moved, as an amendment, that Dr. Atkinson be requested to make certain modifications in, and additions to, his report; and that it be referred to the Publication Committee. Carried.

The discussion of the paper was then in order.

Dr. McQuillen said that several years since a friend of his remarked that "it was a great pity that nature had not been as provident to man as to crabs and lobsters; for when the latter lose their claws, new ones are soon supplied; and he thought that the teeth of man should be restored when lost in the same way." This of course was said facetiously. There was reason, however, for congratulation in observing the efforts which were being made to induce nature to repair the ravages of disease in the osseous system. He was not as skeptical as some of his friends with regard to the statements of Dr. Atkinson. The records of surgery substantiated in the fullest manner the possibility of such things. In connection with this, he referred to the increased size of the *fibulæ* following the loss of the *tibia* from necrosis in a well authenticated case.

Dr. Atkinson reiterated his theory of necrosis, believing it to result from a destruction of the cancellated tissue, and not from periosteal death.

Dr. Flagg moved a suspension of rules to enable Dr. Garretson to address the Association upon this very interesting subject. Carried.

Dr. Garretson said that the nutrition of bone was an agitated subject. He described a very interesting case of a boy who was kicked by a horse, the blow taking effect upon the os frontis, and causing a separation of the scalp and periosteum. By bringing the parts together, union by the first intention was effected. Shortly afterward the child fell and struck the head, separating and throwing back the newly united parts, which afterward sloughed, giving a good opportunity to decide whether or not bone is entirely dependent upon the periosteum for nourishment. It was left denuded for five weeks, when, upon approaching the parts, union was obtained, and the tissue covering that portion of the head is now in a perfectly healthy condition.

Dr. Kingsbury said that the view expressed by Dr. Atkinson, that other tissue than periosteum would produce bone, was not novel, but was also advanced by Dr. Gross in his work upon surgery.

Dr. Watt did not think that the case described by Dr. Garretson would prove that bone could be nourished without periosteum; he had himself suffered with necrosis of a portion of the os frontis; he scraped the diseased surface, and under applications of simple cerate for one week the

parts recovered, and, at the present time, there is but very little trace of its location; besides, he experienced no difference between the sensation of that and the surrounding tissues, a fact, he believed, owing to a reproduction of healthy periosteum.

Dr. Flagg contended that isolated plasma could not organize bone unless emanating from and resting in contact with periosteum. He believed that bone always dies before the periosteum. He thought violent rinsing of the mouth after extraction destroyed the vitality of the parts by preventing the formation of a clot to act as a pouch for the retention and protection of the organizable plasma; consequently where it was absent, he induced its formation by scarification.

Dr. Garretson mentioned the fact that long bones grow from their epiphyses in length, and from the periosteum in circumference. He knew that bone was produced as stated by Dr. Atkinson, but how it was formed he could not say.

Dr. W. H. Allen could testify to the cases described by Dr. Atkinson; he had himself succeeded in partially reproducing the external plate over two denuded incisors. He described a case in which the teeth were very loose, where, from the treatment described by Dr. Atkinson, they were rendered quite firm and serviceable.

Dr. Fitch wanted to know if a tooth deprived of gum and bone for two-thirds or more of its length could be rendered useful by a reproduction of the processes and restoration of the former tissue.

Dr. Atkinson said it could, and cited instances in proof of the assertion, which were vouched for by Dr. Hawes.

Dr. Kingsbury here read an invitation from Dr. Jansen, of the Natatorium and Swimming School, requesting the members to visit that institution.

Dr. Fitch believed that certain membranes govern the production of certain structures, and that secondary structure in character depends upon the crasial condition of the blood and the forces which preside over its formation.

Dr. Taft gave the history of an interesting case of a gentleman, 23 or 24 years of age, of sanguine temperament, and naturally good vital force, but at the time referred to, very much reduced by repeated attacks of fever and ague; there was a large continuous abscess extending over the four superior incisors; tonic remedies were exhibited, and the necrosed bone removed. Tannin, creosote, glycerin, and iodine were the applications employed, and although the treatment extended over the space of three months, the firm retention of the teeth by the reproduction of bone entirely down to their necks fully compensated for its tardiness. He referred to the efficiency of Dr. Atkinson's treatment in reproducing the septum between a second and third superior molar in his own mouth.

Upon motion, the regular order of business was suspended, when Niag-

ara, New York, and Pittsburg were nominated as places for the next annual gathering.

Upon voting, Niagara was unanimously chosen as the place for assembling, on the last Tuesday of July, 1864.

Upon motion, the order of business was resumed, when the Nominating Committee made the following report:—

Committee of Arrangements.—Drs. S. B. Palmer, C. Harris, S. G. Martin.

Committee on Publication.—Drs. J. Taft, W. A. Pease, C. W. Spalding, H. R. Smith, H. A. Smith.

Committee on Prize Essays.—Drs. S. Dillingham, G. T. Barker, G. W. Ellis, A. C. Hawes, W. B. Hurd.

Committee on Dental Physiology.—Drs. C. A. Kingsbury, J. H. Mc Quillen, C. N. Peirce.

Committee on Dental Chemistry.—Drs. Geo. Watt, T. L. Buckingham, H. A. Smith.

Committee on Dental Pathology and Surgery.—Drs. W. H. Atkinson J. F. Flagg, J. L. Suesserott, C. R. Butler, C. P. Fitch.

Committee on Mechanical Dentistry.—Drs. Thos. Wardle, J. G. Cameron, A. W. Allen, S. G. Martin, E. M. Skinner.

Committee on Dental Education. — Drs. J. H. McQuillen, J. Taft, H. R. Smith.

Committee on Dental Literature.—Drs. C. P. Fitch, W. H. Allen, J. F. Johnston.

Upon motion, the report was adopted.

The report of the Committee on Dental Literature was read by Dr. J. H. McQuillen. It embraced a review of the most recent works issued upon dental subjects, and of the various journals, both those which have existed for some time and those of later origin, and congratulated the profession upon their flourishing condition in consideration of the troublous times. He believed that dental literature would bear a favorable comparison with the literature of other professions, but thought that the modification of a certain class of communications would contribute to the reputation of the writers and the profession. He classified the causes of defective productions as follows: "1. Imperfect preliminary education. 2. The absence of a clear perception of the fundamental principles of physiology and pathology. 3. Defective modes of investigation. 4. Too much haste in the preparation of matter for the press." He referred to the means by which such defects could be remedied, dwelt upon the necessity of clothing ideas in clear and terse language, and directed attention to the importance of associated effort, and the present encouraging position of the Association.

The report was accepted and referred to the Publication Committee.

D. Hawes' resolution relative to the publication of the proceedings was called up, and considerable discussion ensued.

Adjourned.

THIRD DAY.—*Afternoon Session.*

Called to order at four o'clock P.M. The minutes of the morning session were read and accepted. Dr. Hawes' motion was discussed at great length, and, upon a final vote, was lost.

A letter from Dr. Pease was received and read, in which he regretted his inability to be present; he stated that he would not permit professional business alone to detain him; but that matters of a very urgent character claimed his attention at home. He closed with wishing the Association a good and profitable session.

Dr. Watt moved that the distribution of Transactions be made in favor of local societies, although any one on paying may be entitled to receive them. Carried.

The report of the Committee on Dental Education was read by Dr. Ellis. It referred to the present advanced condition of dental science, and the consequent necessity of a more thorough system for the impartation of instructions; the establishment of colleges to meet this demand was alluded to, whose teachings, in connection with the assistance of private preceptorship, were believed to constitute the most desirable system of dental education. The duties of the college, preceptor, and student were severally examined. In conclusion, reference was made to the creditable condition of dental journalism, and the profession congratulated upon their associated efforts as eliciting valuable information and promoting sociability and fellowship.

A paper on Professional Education was read by Dr. Flagg, in which he classified professional men according to their ability and desires, forming several degrees or stages; the peculiarities of each division were analyzed, and the results of their respective efforts defined. Referred to the Committee on Publication.

A paper on "Dental Education," from Dr. Latimer, was read by Dr. Fitch, and referred for publication.

Dr. Pease, in a letter, stated that as a member of the Committee on Dental Physiology, he had made some investigations and obtained some facts which he had designed to present, but other duties prevented his embodying them in a regular report.

On motion of Dr. Ellis, Dr. Pease was requested to present the results of his examinations in the form of a paper at the next annual meeting.

Dr. Butler offered the following:—

Resolved, That this Association tender a vote of thanks to Prof. Henry Morton, of the Philadelphia Dental College, for his kind invitation extended to the members of this body to witness some electrical experiments

by a new apparatus, which were produced with a most beautiful, pleasing, and instructive effect. Adopted.

Adjourned.

FOURTH DAY.—*Morning Session.*

Called to order at nine o'clock. The minutes were read and approved.

A paper on "The Extraction of Teeth" was read by Dr. Ellis, in which the qualifications of an operator, the peculiarities of the necessary instruments, the method of their employment, and the character of the after-treatment were severally considered. Referred to the Committee on Publication.

Dr. Allen read a paper upon "Irregularity," describing its various forms and specifying the individual treatment. It was a valuable paper, and contained much that was practical and profitable. Great interest was manifested during its reading, and at its close, remarks of appreciation were freely expressed.

The following resolution was offered by a letter from Dr. Hawes, which was read by Dr. Flagg:—

Resolved, That in our deliberate judgment, the frequent and indiscriminate extraction of teeth, for trifling, temporary, and other wholly unnecessary causes, which has so long and so extensively prevailed, should not only be held perfectly inexcusable, but should be severely censured; and that an intelligent and patient remedial treatment for their restoration from disease and permanent preservation should be the first and highest aim and effort of our profession; and should also be most earnestly explained and recommended to the public. And further, that in our belief the progress of dentistry, at the present day, has revealed resources, varied and ample enough when timely used, for the preservation of almost every tooth, so that its decay and extinction shall only be simultaneous with that of the human frame itself. Adopted.

A paper from Dr. Hawes, on "Exposed Pulps and Alveolar Abscess," was read by Dr. Flagg. He lamented the great amount of malpractice, and thought from the present state of knowledge, we were able to treat successfully almost every pathological condition of the teeth. When a pulp is *exposed,* he advocates its prompt destruction and entire removal, and believed that ninety-five per cent. of such operations would prove successful; attempts for its preservation after exposure, he thought would mostly meet with failure—success being the exception rather than the rule. In excavating, he advocates leaving a small portion of decomposed dentine, if the exposure and destruction of the pulp is feared as a consequence of its removal. In case of simple periostitis occasioned by the extirpation of a pulp and the filling of the tooth, he resorts to depletion by leeches, that alone generally proving sufficient. In benign abscess he cleanses and dresses with creosote. The remedies he employs in chronic abscess are a solution of iodine in creosote, creosote, nitrate of silver, and chlorate of potassa. Referred for publication.

Dr. Atkinson read a paper upon the "Institutes of Dental Science," in which he referred to the importance of the branch, and expressed his pleasure at the establishment of this chair in two of our dental schools; he dwelt upon the elevated character of the position and the weighty responsibilities resting upon its incumbent, who should be a man of superior attainments to creditably fulfill its requirements. He advocated fraternization to acquaint us with ourselves and with each other, and enable us to make a choice of proper and able men for such important posts. Referred for publication.

The report of the Committee on the Formation of Local Societies was presented by Dr. Taft. He stated that the object of the committee was to confer with members of the profession relative to the formation of local societies. The importance of association was considered, especially in dentistry, mingling as it does medical, mechanical, and artistic skill. The influence of the National Association in stimulating the formation of local organizations was referred to, and a description given of the origin and present condition of the various societies. Referred to the Committee on Publication.

The committee to decide "whether metals expand in the act of congelation," was continued.

Dr. McQuillen offered the following:—

Resolved, That a committee of five be appointed by this Association to confer with Surgeon-General Hammond relative to the appointment of dentists to the military hospitals of the United States, and also to secure, if possible, prompt and successful action on the part of Congress, by having petitions prepared, signed, and sent to that body from all parts of the country in favor of the measure.

After much discussion, it was adopted.

Dr. Kingsbury moved that the Chair appoint the committee. Carried.

The Chair appointed Drs. J. H. McQuillen, C. W. Spalding, J. Taft, C. P. Fitch, and H. N. Wadsworth.

Dr. Watt proposed the following amendment to the Constitution. That in Art. 5, Sect. 1, the words "nine members appointed by the Association," be substituted for "one from each delegation;" and the word "majority" be substituted for "plurality."

Dr. Stone's amendment, proposed at the last session, striking out all of Sect. 5, Art. 3, after the word "members," was unanimously adopted.

Dr. Atkinson offered the following:—

Resolved, That we testify from personal experiment, that we highly appreciate the cleansing, invigorating, and harmonizing influence of going through the roll of action at the Natatorium, kindly afforded this body by Dr. Jansen. Carried.

Dr. Palmer read an introductory paper, after which he exhibited some very superior instruments of his own manufacture, designed for the preparation and filling of fang canals. He described his method of temper-

ing, the main object being to prevent the penetration of the slightest color upon the point or cutting edge; this is prevented by grasping that portion of the instrument between the beaks of a pair of ordinary pliers. At the close of his remarks, the instruments and models were placed in the hands of the President as a gift to the Association.

Dr. Butler employed Dr. Palmer's method of tempering, with the exception of using two materials—a liquid and a semi-solid, into which the instrument was successively plunged. Of the composition of these substances he was ignorant, yet he was satisfied of their great virtue in producing a temper much finer than when water alone is used.

Dr. Allen exhibited the models of several cases, both before and after the operation, in which he had restored the cutting edges of incisors by building up with gold. These fillings were satisfactorily performing all the services of the original tooth substance.

Adjourned.

FOURTH DAY.—*Afternoon Session.*

Called to order at four o'clock. Minutes of the previous meeting read and approved.

Upon motion, Dr. Palmer's paper was referred to the Publication Committee, his donation accepted, and a vote of thanks tendered.

Dr. McQuillen moved that drawings of Dr. Palmer's models be embodied in the report. Carried.

Dr. Ellis moved that Dr. Allen's interesting models also be included in the report. Carried.

Dr. McClellan referred to the great and objectionable bulkiness of rubber work. This he has remedied by the introduction of an eighteen carat gold gauze or web, when the work may be rendered very thin without endangering its strength. He exhibited a case so prepared, and stated that for this method he had procured a patent.

Dr. Gorges described a case in which he had restored the contour of the face by the application of simple gutta-percha to teeth mounted on a metallic plate; this is retained by forcing it into the spaces between the teeth, previously ground so as to retain it. Any bulk may be obtained, and in case repair becomes necessary, it is easily removed and replaced.

Dr. Taft, the Secretary, rendered an account of the expenses of the session.

Upon motion, the Chair appointed Drs. Benedict and Flagg a committee to audit the Treasurer's account.

Dr. Spalding read the following, and, upon his motion, it was referred to the Publication Committee:—

A meeting of the members of the American Dental Association residing abroad was held at the Continental Hotel, on Friday, July 31st, 1863, at 3½ P.M. The meeting was called to order by Dr. C. W. Spalding, of St. Louis, who stated the object of the meeting; when, on motion,

Dr. W. H. Allen, of New York, was called to the chair, and Dr. C. W. Spalding was appointed Secretary. The following resolution was then offered and unanimously passed:—

Resolved, That the members of the American Dental Association, not resident at the City of Philadelphia, take pleasure in returning their most sincere thanks to their Philadelphia brethren for the cordial reception which they have received at their hands, and for the hospitable manner in which they have been entertained during their stay in this city.

On motion, adjourned. C. W. SPALDING, Secretary.

Upon motion, the Committee on Local Societies was continued.

The Auditing Committee reported a balance of $19.75, after the defrayment of all present expenses.

Upon motion, a vote of thanks was tendered the Academy of Natural Sciences, for the invitation extended the Association to visit and examine their rare and extensive collection.

Dr. Atkinson moved that the Committee of Arrangements be relieved of the duty of selecting subjects for dicussion. Carried.

Dr. Atkinson moved that the Publication Committee be requested to have the proceedings out by the first of October. Carried.

On motion, the donations were left in the hands of the Secretary.

Dr. Allen said that as the time of sitting was now drawing to a close, he could but express his pride and satisfaction at the manner in which the present session had been conducted, and hoped that each one would constitute himself a committee of the whole to stimulate dental energy. He thanked the Philadelphians for the bountiful hospitalities which they had extended, and should anticipate with pleasure a general reunion at Niagara Falls, on the last Tuesday of July, 1864.

Adjourned.

PROCEEDINGS OF THE AMERICAN DENTAL CONVENTION.

REPORTED BY G. W. ELLIS, M.D.

THE Convention met on Tuesday, August 4th, 1863, at White's Hall, Saratoga Springs, New York, and was called to order by Dr. W. B. Roberts, acting as President *pro tem.*

Upon examination, Drs. Buckingham and Robins reported the sum of one dollar as the individual assessment necessary for the creation of a fund sufficient to defray the expenses of the session.

The following gentlemen then presented, paid the required amount, signed the Constitution, and became members of the Convention:—

CONNECTICUT.—W. W. Sheffield, New London; J. Woolworth, E. Strong, C. L. Smith, New Haven; T. S. Scranton, Madison; A. Hill, Norwalk; J. T. Metcalf, New Haven; J. B. Snow, Bridgeport; J. A. Pelton, Middletown.

Delaware.—Wm. G. A. Bonwill, Dover.

Massachusetts.—T. Palmer, Fitchburg; J. Fiske, Clinton; W. L. Bowdoin, Salem; O. F. Harris, Worcester; F. Searle, Springfield; H. F. Bishop, Worcester; G. L. Cooke, Milford; S. D. Shepard, Amherst; W. H. Jones, Northampton; Geo. F. Newton, Worcester; H. M. Miller, Westfield.

Michigan.—H. Benedict, Detroit; J. A. Watling, Ypsilanti.

New Jersey.—A. W. Kingsley, Elizabeth; J. C. Robins, Jersey City.

New York.—B. T. Whitney, Buffalo; L. W. Rogers, Thomas D. Evans, Utica; A. C. Hawes, W. H. Atkinson, New York City; A. T. Smith, Syracuse; Wm. C. Parks, Williamsburg; J. H. Smith, New York City; D. S. Goldey, Oswego; S. B. Palmer, Tully; S. Mapes, Fishkill Landing; E. M. Skinner, Syracuse; C. B. Foster, Utica; J. L. Clark, Waterloo; S. L. Smith, Ballston Spa; C. H. Eccleston, Utica; A. N. Priest, J. A. Perkins, Albany; W. W. Perkins, Baldwinsville; J. G. Barber, Le Roy; W. A. Bronson, N. W. Kingsley, New York City; E. W. Sylvester, Lyons; F. O. Hyatt, Courtland; L. W. Bristol, Lockport; A. M. Holmes, Morrisville; N. D. Ross, Troy; S. D. Arnold, Ballston Spa; G. Chevalier, New York City; Monroe Frank, Courtland; B. S. Burnham, Fort Edward; S. M. Robinson, Watertown; W. B. Roberts, F. H. Norton, New York City; R. M. Howard, Knox Corners; A. Jones, New York City; B. Wood, Albany; J. P. Beardsley, Clinton; H. Jameson, Jr., Lyons; G. B. Snow, Buffalo; E. L. Fuller, Peekskill; T. G. Lewis, Buffalo; M. Tefft, Cambridge; J. A. Chase, Genesee; E. A. L. Roberts, New York City; S. D. French, L. C. Wheeler, S. J. Andres, Troy; O. E. Hill, Brooklyn; J. Allen, New York; P. Harris, Skaneateles; H. A. Coe, Theresa; W. H. Dwinelle, New York; Geo. S. Allan, Newburg; Geo. Howell, Riverhead, Long Island.

New Hampshire.—G. A. Young, E. G. Cummings, Concord.

Ohio.—C. R. Butler, Cleveland; G. Watt, Xenia; H. A. Smith, Cincinnati; C. Palmer, Warren; A. E. Lyman, Newton Falls; G. W. Keely, Oxford; J. Taft, Cincinnati.

Pennsylvania.—J. B. Williams, Monongahela City; T. L. Buckingham, C. N. Peirce, H. Townsend, O. Lund, G. W. Ellis, S. S. White, Philadelphia.

Rhode Island.—F. N. Seabury, Providence.

Vermont.—H. H. Newton, St. Johnsbury; J. N. Scranton, Bennington; H. Kingsley, Middlebury; S. K. Thompson, Poultney; E. V. N. Harwood, Rutland.

Wisconsin.—H. Faville, Milwaukee.

The Executive Committee, appointed by the President to prepare the order of business for 1863, reported the following subjects for discussion, which were adopted:—

I. Causes Influencing an Abnormal Development of the Teeth.
II. Treatment of Dental Irregularities, and Appliances for the same.
III. 1. Filling Teeth. 2. Filling Temporary Teeth. 3. Best Material for the same.
IV. Diseases of the Antrum, and Treatment.
V. Treatment of Cleft Palate.
VI. Alveolar Abscess.
VII. Mechanical Dentistry.
VIII. Miscellaneous Business.

W. H. DWINELLE,
W. A. PEASE,
W. D. STONE,
D. W. PERKINS,
T. L. BUCKINGHAM,
Committee.

The minutes of the preceding session were then read by the Secretary, Dr. Searle, and, upon motion, adopted.

The reports of officers and committees were declared in order.

The Treasurer then made the following statement:—

Receipts of last year	$119 77
Disbursements	57 08
Balance	$62 69

The President appointed a committee of three—Drs. Whitney, Rogers, and Foster—to audit the Treasurer's account, which was reported correct, and accepted.

Upon motion of Dr. Rogers, Mr. F. H. Norton was appointed by the Convention to furnish the Saratoga press with a daily account of its proceedings, at an expense not exceeding fifteen dollars.

Dr. Whitney moved that the Convention sit between the hours of 9 A.M. and 2½ P.M., holding but one session.

Dr. Atkinson then offered an amendment, advocating two sessions, from 9 A.M. to 1½ P.M., and from 4 to 6 P.M.

After some discussion, the amendment was adopted.

Dr. Whitney moved to proceed according to the order of business adopted at the last annual meeting. Carried.

The election of officers for the ensuing year being next in order, the Chair appointed as tellers Drs. Buckingham and Kingsley.

Upon separate ballot, the following gentlemen were unanimously chosen to fill the offices in the gift of the Convention:—

President.—Dr. J. TAFT, Cincinnati, Ohio.

Vice-President.—W. W. SHEFFIELD, New London, Connecticut.

Corresponding Secretary.—W. H. ATKINSON, New York, N. Y.

Recording Secretary.—C. N. PEIRCE, Philadelphia, Pennsylvania.

Treasurer.—A. C. HAWES, New York, N. Y.

Adjourned.

FIRST DAY.—*Afternoon Session.*

The meeting was called to order at four o'clock.

A letter was then read from the retiring President, Dr. Westcott, in which he dwelt upon the importance of associated effort in contributing to advancement; regretted his inability to be present with his old co-laborers, and patriotically closed with a hope that the body would not finally adjourn without first giving three times three for our beloved Union.

The President and Vice-President both being absent, Dr. W. B. Roberts continued to discharge the duties of the presiding officer.

Essays being next in order, Dr. Sylvester read a paper upon "Causes Influencing an Abnormal Development of the Teeth,"* in which he drew comparisons between the teeth of the aborigines and present inhabitants of our country. He believed decay the result of a violation of nature's laws, and traced it to one or more of the following causes: 1. Parental influence. 2. Gestatory influence. 3. Improper diet. 4. Impure air. 5. Want of exercise.

Dr. Searle would like to know when the results of parental influence were first manifested, and how we could account for the origin of the first case?

Dr. J. A. Perkins had never seen a case of marked irregularity in the temporary teeth, and thought them very rare.

Dr. Atkinson said we were in deep water, and thought but little could be done to elucidate the subject until it was taken from the basis and treated serially, gradually arriving at the highest type. He referred to the importance of proper nourishment for children, particularly a free exhibition of food containing the phosphates.

Dr. Burnham directed attention to the great effect of hereditary influence.

Dr. Hawes thought that a deformity of one-half of the arch of a child in conformity with one parent, and the other side perfect in resemblance of the other parent, was a new idea; although he had seen such cases of irregularity, he had never thought of tracing them to such a combination of causes.

Dr. Buckingham had seen such cases as those just referred to, and would be unable to suggest any remedy until empowered with the regulation of marriages, so as to bring together only persons of perfect physical development, and thus regulate the formation of structure. He believed that defective teeth were oftener the result of *over* than of under-feeding; he favored the use of food containing the phosphates as insuring the production of dense and durable teeth.

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* See page 58.

Dr. Searle said that we were ignorant of the cause or causes of irregularity, and thought it was generally the result of circumstances purely accidental. He mentioned in illustration a case in which the lower teeth of the left side articulated entirely outside of the upper ones; this was occasioned by the malpresentation and neglect of a single tooth, whose early correction might have prevented the occurrence of the deformity. He thought the only remedy was close attention on the part of the dentist, who should frequently see his cases and combat these accidents as they may arise.

Dr. Whitney thought the mixture of races was a fruitful source of irregularity, and referred to the most prominent peculiarities of facial and dental organism in the Germans and Irish, and the medium between the two produced by intermarriage.

Dr. Perkins thought that the sour acorn eaten by the Digger Indians was probably a cause of their deformed teeth.

Dr. Watt said that defective structure resulted from tissue defective in quantity or quality. Although it may be impossible to entirely counteract hereditary tendencies, much may be done to cultivate a better condition and thus partially avoid their influences. He believed that a deficiency of phosphates in the mother's milk from defective food furnished that parent, was a fruitful cause of imperfect dental development; to obviate such results, he would exhibit them to the mother either in food or as the phosphate of lime; he was aware that the insolubility of the latter substance might be urged as an objection to its administration. He had, however, fed a dog for thirty-six hours upon this substance alone, and upon opening the animal at the expiration of that time, found it all dissolved; he consequently believed it less insoluble than generally stated. He mentioned the case of a woman whose children's teeth *all* decayed upon eruption; he prescribed the free use of phosphate of lime for one year; his directions were implicitly obeyed with the most gratifying result, the children who were born during the treatment being blessed with finely developed dentures. Upon its omission during a subsequent pregnancy, the old difficulty recurred in that child; its resumption, however, at a later term, was followed by the previous beneficial effects.

Dr. Williams remarked that one other cause of abnormal development which had not been mentioned, was the injurious effect of the breath of the mother in nursing. At each expiration of the nurse, carbonic acid gas is thrown down upon the child, depriving it of the oxygen of the pure air, causing it to become restless and fretful, pale and sickly. Mothers, though unconscious of the fact, destroy their own offspring, and thousands die from this very cause. He thought that the cause of humanity demanded more attention than has yet been given to this subject.

Dr. Ellis said that, in addition to the deleterious influences already re-

ferred to, there was still another in relation to atmospheric air, not its impurity, but its introduction into the lungs through an improper channel, the mouth. His attention was first directed to the subject through the perusal of a very interesting work from the pen of Mr. Geo. Catlin, in which, through many well sustained and reasonable arguments, he endeavors to prove the baneful effects of the pernicious habit of "breathing through the mouth." His statements, which are based upon the results of long and careful investigation, deserve the attention and consideration of the profession.

Dr. Peirce dwelt upon the influence of measles, and other infantile diseases, in causing an abnormal and defective tooth structure; their effects being frequently demonstrated upon particular teeth then in progress of development. Disease of the mother during pregnancy would, he believed, so unfavorably impress the fœtus as to occasion an imperfect formation of tooth tissue.

Upon motion, adjourned.

SECOND DAY.—*Morning Session.*

Called to order at nine o'clock.

Vice-President, Dr. Sheffield, in the Chair.

The minutes of the previous meeting were read and adopted.

Dr. W. B. Roberts offered the following:—

Resolved, That the Chair appoint a committee of five to make proper arrangements for observing the Day of Thanksgiving appointed by the President of the United States. Carried.

In accordance with this resolution, the Chair appointed Drs. W. B. Roberts, Rogers, Kingsley, Watt, and Atkinson.

The Committee on the Introduction of Dentists into the Army was reported by Dr. Atkinson, when Dr. Buckingham moved the reappointment of a committee on this subject.

The second subject of discussion, "Treatment of Dental Irregularities, and Appliances for the same," was declared in order.

Dr. Kingsley said that he deprecated the use of complicated apparatus which necessitated a foolish and unprofitable waste of time, labor, and expense. To give a general idea of his method of correcting irregularities, he imagined two cases: one in which an upper central incisor stood within the arch, and another in which two central incisors, upper, required turning upon their axes. In the former case, he would fasten a gold band outside of the arch, securing it to the back teeth, and place a gum-elastic strip around the tooth, fastening it to the band, the contraction of which strip would draw the tooth directly into place; in the latter case, he would also use the gold band and gum-elastic strips, but would nick the wire in order to retain the elastic bands apart, when tied, so as to give a rotary movement to the tooth.

Dr. W. B. Roberts thought Dr. Kingsley's method a very good one; he had himself been in the habit of punching a hole in the band and fastening several small pins on the outside, when the ligature, by being drawn through and looped over the pins, could be conveniently lengthened or shortened.

Dr. T. Palmer strikes up a gold or platina plate covering the roof of the mouth, and allows the teeth to project through, thus leaving a band upon the outside; he makes his attachments to this plate; any difficulty from its riding up may be obviated by permitting it to cover a molar tooth.

Dr. J. A. Perkins described a case which he had successfully treated.

Dr. Eccleston also described a case in which he had obtained a successful result.

Dr. Ellis said that in the first case described by Dr. Kingsley, he would adopt a still simpler method, and employ a piece of gum-elastic tubing alone, which he would tie with a silk ligature to the other central, so as to bring the knot on the centre of the labial face, and, stretching the band between the two, carry it behind the irregular tooth up between the central and lateral, and make it fast upon the labial face of the latter tooth, constituting at once a simple and effective appliance. To turn a tooth upon its axis, he would apply two ligatures with gum-elastic rings, one starting from the labial face and running inward, and the other starting from the palatine face and running outward, the two forces so operating as to rotate the tooth in its socket; occasionally some auxiliary arrangement may be necessary, but this is very seldom or scarcely ever required.

Dr. Woolworth said, in the correction of an irregular arch he would apply ligatures so wound between the teeth as to exert pressure in the desired direction, somewhat upon the principle of the figure of 8, having both turns, however, to pass over the same side of the tooth which it is designed to move.

Dr. Watt was inclined to dispense with metallic bands and appliances; he employs flax in preference to silk for ligatures, since it possesses more contractile power. Flax, he thought, was also more desirable than rubber, for it contracts to a certain point and then firmly retains the tooth in position, allowing it some time to recuperate; rubber, however, exerts a *continual* traction, occasioning much soreness, and endangering the life of the periosteum.

Dr. Ellis thought that rubber ligatures in judicious hands would seldom destroy vitality in the periosteum; that membrane, on the contrary, will undergo very harsh treatment without injury, and its tenacity of life is proverbial.

Dr. Goldey said that where two central incisors stand with their mesial faces presenting inward, he would adjust two small gold bars, one upon

the outside and one upon the inside, and connect the two with a rubber ligature passing between the teeth; this apparatus he has found effective in such cases.

Dr. Sylvester described a case in which the upper cuspidatus closed inside of the lower arch. This he corrected by means of a rubber plate fitting the lower jaw, and provided with an inclined plane; in front of the lower cuspidatus was an opening with two bands, which, from time to time, were oiled and bent inward, thus exerting a pressure upon that tooth to carry it under.

Dr. Butler advocated rubber for moving teeth, and believed it powerless for harm in educated and scientific hands; the *continual* pressure objected to he regarded as advantageous in expediting the operation, while the soreness referred to was seldom experienced after the first application.

Dr. E. A. L. Roberts uses rubber for the regulation of teeth, and retains them in position by ligatures of thread.

Dr. Bonville exhibited an ingenious and somewhat complicated apparatus adapted to a model of the case which it was designed to correct.

Dr. Buckingham thought that we should endeavor to avoid a hasty condemnation of any apparatus; all no doubt possessed some valuable points and might in turn prove serviceable. He expands the jaw by the accurate adjustment of springy plates.

Dr. W. B. Roberts described a case in which all the upper teeth between the bicuspids were in and out alternately; he corrected it by ligatures fastened to a plate which was swaged to fit the entire mouth, with a semicircular opening for the teeth to project through, thus leaving a bar upon the front of the arch.

The President, Dr. Taft, having sufficiently recovered from his indisposition to participate in the proceedings, entered the hall, when he was greeted with an earnest and hearty welcome, and Drs. Watt and Hawes were appointed a committee to conduct him to the chair.

Upon taking his seat, he remarked that he had learned with surprise of his appointment; he thanked the Convention for this mark of kindness, and promised to be present and discharge his duties so far as his health would permit.

Dr. Buckingham explained a simple buffer, formed from a piece of metal cut in the form of the letter H; the perpendicular pieces are bent so as to clasp a molar inside and out, with the horizontal bar passing over the grinding surface.

Dr. Searle related a case of undue prominence of the upper teeth, which occurred in the practice of Dr. Brewster. The patient, a Russian nobleman, was excessively sensitive with regard to the deformity, and exceedingly anxious to have it corrected; after visiting, however, several dentists and physicians of repute, and meeting with no encouragement,

he was about to resign all further efforts, when he came under the notice of Dr. Brewster, who promised to attempt the case if his instructions were implicitly obeyed, and the utmost patience exercised in relation to the final result. The apparatus employed consisted of a saddle upon the back of the head, with a ligature passing directly over the front teeth; and in eight months so great a change was wrought that, upon returning home, his friends failed to recognize him.

The Committee on Thanksgiving reported, and recommended the devotion of the hour, between 9 and 10 A.M., to religious exercises. Carried.

Dr. Burnham moved that 4½ P.M. be set apart for the choice of a place for the next annual session. Carried.

Upon motion, the consideration of the third subject, "Filling Teeth, Filling Temporary Teeth, and Best Material for the same," was in order.

Dr. Rogers said that although he regarded gold as the sheet-anchor, yet in certain places he believed tin foil the best material for filling and preserving teeth; he was willing to admit that in some locations it was not desirable, as, for instance, in front teeth and upon grinding surfaces.

Dr. J. A. Perkins directed attention to the use of the mallet; he uses spongy gold, No. 1. He indorsed Dr. Rogers' remarks; yet, since the introduction of Dr. Wood's plastic metallic filling, he was inclined to give it the preference over tin foil.

Dr. Smith mentioned the case of a lady now stopping at the Springs, in whose mouth he had recently examined some *good* tin foil fillings of thirty-four years' standing.

Dr. Hawes would be sorry to hear the Convention pronounce in favor of any material over gold; he preferred the latter metal above all else for filling teeth. Where tin foil had been used, he noticed a discoloration of the tin, and believed it an indication of corrosion.

Dr. Atkinson regarded the question under consideration as one of paramount importance. He did not believe gold the best material for filling teeth under *all* circumstances. Gold, if absolutely indestructible in the mouth, must depend in a great measure for its value upon a proper introduction, for the condemnation of a poor gold filling implies an inferiority not of the metal, but of the operation. When he was young dentists were in the habit of filling grinding surface cavities only, and leaving them with a concave surface. The superiority of a filling consists in having it and the tooth exert a mutual support, and in all first-class operations the filling has a flange or bevel at the top. He fills and burnishes by the mallet. He does not hesitate about leaving a covering of disintegrated dentine for the protection of the pulp, having thoroughly saturated it with pure creosote before the introduction of a filling. When it becomes necessary to separate teeth, he wedges an opening in ten

minutes by malleting between them a wooden wedge adapted in shape to the space where it is intended to go.

Dr. J. A. Perkins described a case in which he filled a bicuspid inside of an accurately fitted silver band, using the mallet and afterward removing the band.

Dr. Atkinson said that in annealing gold, the lower the heat the greater the softness, and *vice versa.*

Adjourned.

SECOND DAY.—*Afternoon Session.*

Called to order at four o'clock.

Dr. Wood read a paper on "Fusible Metal Fillings."*

Dr. J. A. Perkins described a case in which he inserted a silver screw into the fang canal, and built upon it with fusible metal so as to form the entire tooth of that material.

The selection of a place for convening in 1864 was declared in order, when the following names were suggested: Niagara Falls, Detroit, Philadelphia, Cleveland, Fort Edwards, Newport, and Brooklyn.

After much balloting, Philadelphia received the choice.

Upon motion, Dr. Wood exhibited his instruments, and demonstrated the method of manipulating his plastic filling.

Dr. Buckingham asked whether the range of temperature in different kinds of food would occasion contraction or expansion of Dr. Wood's filling.

Dr. Wood, in reply, said that he had never tested it, but thought it likely that it would.

Dr. Watt believed that in the solid state it obeyed the laws regulating all other metals and alloys; he thought that some alloys would expand in the act of congelation and afterward contract.

Dr. W. B. Roberts thought that all metals would contract and expand from cold and heat; he would not theorize, however, in this direction, but wanted dentists to give Dr. Wood's filling a thorough trial and test its merits.

Dr. A. Hill said that Dr. Wood advocated filling the base of large cavities with Hill's stopping, and capping with the fusible metal.

Dr. Atkinson uses Dr. Wood's plastic metal almost everywhere where he cannot employ gold, and regards it as a very valuable addition to the list of materials for filling teeth.

Dr. J. A. Perkins uses Hill's stopping and Wood's fusible metal in the same cavity. He referred to the great amount of work necessary to do a first-class operation, both in the preparation of the cavity and the introduction of the filling.

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* See page 61.

Dr. Butler wanted to know of Dr. Wood how he would manipulate his plastic filling in front teeth where the enamel was very thin.

Dr. Wood replied that he would cover the entire surface of the cavity with a sheet of gold foil, not permitting it to protrude, however, as the contact of the two metals might occasion galvanic action.

Dr. Watt said that for seven years he had used nothing but gold and Hill's stopping; but about one year ago he introduced three fillings of tin foil, and three of Wood's metal, and upon recent examination the alloy was found to be in much the best condition. He regards Dr. Wood's plastic metallic filling as a blessing to the profession. He said that a tin filling was injured more by the action of chlorine than oxygen.

Dr. C. Palmer testified to the serviceability of Dr. Wood's filling. He had been in the habit of first placing a layer of gold foil under tin and fusible fillings, as suggested by Dr. Butler.

Dr. Tefft described a tooth of his own in which Dr. Wood's filling had been introduced.

Dr. Eccleston had observed the fact that tin fillings would produce a hardened condition of the dentine.

Dr. C. Palmer exhibited and described his instruments for fang filling.

Dr. Atkinson exhibited his mallet and filling instruments.

Adjourned.

THIRD DAY.—*Morning Session.*

Called to order at nine o'clock.

The President in the Chair.

The devotional exercises were opened by the reading of a Psalm by Dr. Watt; this was followed with a Hymn by Prof. Wood, assisted by Drs. Sheffield, Perkins, and Rogers, when the Rev. Mr. Anderson, of Brooklyn, made a touching and appropriate prayer. Governor Cannon, of Delaware, being present, was called upon, and responded in a short and well-timed address. After a prayer, by Dr. Sylvester, Drs. Rogers, Watt, and Atkinson each delivered a few remarks suitable to the occasion, when the Rev. Mr. Anderson followed in a beautiful and patriotic address, which was received with marks of unbounded approbation. After the singing of the Doxology and the offering of a Benediction, the religious exercises terminated.

The regular order of business was resumed at 10½ o'clock, when the minutes of the previous meeting were read and approved.

The President then announced the following gentlemen as constituting the Executive Committee for the ensuing year:—

Drs. L. W. Rogers, Utica, New York; A. W. Kingsley, Elizabeth, New Jersey; J. A. Watling, Ypsilanti, Michigan; A. Hill, Norwalk, Connecticut; H. A. Smith, Cincinnati, Ohio.

The consideration of "Cleft Palate" was then declared in order.

Dr. Atkinson said that the causes of cleft palate might be either

dynamical, chemical, or mechanical. He believed that the sooner an infant was operated upon the better, before or at the eighth day being the most desirable time; he freshens the edges of the fissure and approximates the parts, holding them together with sutures of soft silver wire; if there is difficulty in bringing the opposite surfaces in contact, he slits up on each side, allowing the newly-made wounds to heal by granulation. Sometimes, instead of operating, he finds it preferable to introduce a plate, covering and closing the palatine opening. In the operation for fissured lip, he fastens the freshened edges together by needles wound with a figure-of-8 suture, and cautions those having charge of the infant against the danger of its loosening the attachments by sucking.

Dr. N. W. Kingsley explained the difference between *voice* and *speech:* the former being natural, and the latter acquired. He did not think the voice was benefited by the performance of an operation; its chief necessity was to improve the function of deglutition and accomplish perfection of speech, the latter of which results he never knew to follow the use of the knife. He noticed the danger of staphyloraphy and the imperfect velum which was almost invariably the result of its performance, never being tight and mostly deficient at the posterior surface. To accomplish the object of treatment, viz., a substitution so far as possible for the deficient parts, he favored the use of mechanical appliances constructed of *elastic* vulcanized rubber, believing gold to be incapable of meeting the necessary requirements. He exhibited his invention, which elicited the admiration and approval of the entire Convention. For the manufacture of his artificial velum, a *perfect* impression of the parts is absolutely necessary, reaching back to the posterior part of the fauces and well up into the cleft. His remarks throughout were illustrated by diagrams upon the blackboard.

Dr. Dwinelle indorsed all the statements of Dr. Kingsley, who had made a specialty of this subject, and labored assiduously for its advancement; he expressed himself decidedly in favor of specialties.

Dr. N. W. Kingsley exhibited some models which he had taken, whose perfection were really beautiful; he employs plaster for obtaining impressions, using it in sections to insure its drawing from the parts. After securing an accurate impression, he makes a model of sheet gutta-percha, (any other plastic material will answer equally well,) thickens the appliance in front, behind it must be elastic, and reach over the edges of the fissure above; he then makes a velum of hard rubber, which, if correct, he duplicates in elastic rubber. He exhibited and described several specimens, one of which was an exceedingly difficult case, in which the velum was made to support an entire upper artificial denture. He stated that he had, by means of the artificial velum, rendered the speech of patients, whose conversation it was impossible to understand, so perfect and intelligible that any remaining peculiarity would escape detection except by

the professional and practiced ear. Before taking an impression, he makes progressive attempts in order to accustom the parts and establish a tolerance to the presence of the plaster.

Dr. Dwinelle explained Dr. Kingsley's method of taking impressions in sections, and the dexterity requisite to separate the parts at exactly the proper time.

Dr. N. W. Kingsley vulcanizes the velum in a mould of type metal, in order to avoid the excrescences which a plaster model always presents, and thus also provides for the construction of duplicates when required. The rubber used is prepared expressly for the purpose. When practicable, the apparatus is confined forward by clasping to the teeth upon both sides.

Dr. John Allen indorsed with pleasure the statements of Dr. Kingsley, and congratulated him and the profession on the result of his efforts; he considered that Dr. Kingsley attained a higher point in this direction than had ever before been reached, and could appreciate the self-culture and patient perseverance necessary to accomplish such a success.

Dr. N. W. Kingsley said that Delabarre had constructed an artificial velum, but no description of the instrument is on record. He found Dr. Stearns in New York, and the rumor of his operations first suggested the idea of employing vulcanized rubber; the instrument constructed by Dr. Stearns was excessively clumsy, accomplished an imperfect result, and was too poorly adapted to admit of general use.

Dr. Searle gave an account of his fellow-townsman, Dr. Stearns, who labored incessantly for the construction of an instrument to remedy his defective speech, consequent upon a fissured palate, and by dint of the greatest perseverance finally succeeded in obtaining one which answered his purpose quite satisfactorily; this was the first one of the kind that had come under Dr. Searle's notice; for the very great modifications and improvements, he thought Dr. Kingsley entitled to the highest credit.

Dr. Hawes offered the following:—

Resolved, That a vote of thanks be tendered Dr. Kingsley for the very interesting and valuable description of his method of treating cleft palate.

Dr. A. Hill appreciated and valued Dr. Kingsley's improvement and remarks; was gratified to have heard them, and knew that the invention was the result of great perseverance and reflection. He believed that these great triumphs legitimately belong to American dentistry, and hoped that it would continue, as heretofore, ahead! He would not wish to detract the least from Dr. Stearns, but thought very great credit due Dr. Kingsley.

Dr. Dwinelle regarded the *perfection* of Dr. Kingsley's instrument of the greatest importance. Credit, he thought, was due Dr. Stearns for his conception of such an appliance, yet for its adaptability to and tolerance by the tissues with which it comes in contact, Dr. Kingsley is entitled to the highest commendation.

Dr. J. Allen said that if the result of a project was not accomplished

and another succeeded in bringing it to perfection, to the latter he regarded the credit due.

Drs. O. E. Hill, Whitney, Perkins, and others participated in the discussion, and all united in according Dr. Kingsley the greatest praise.

Dr. O. E. Hill offered the following amendment to Dr. Hawes' resolution: "And to him is due the honor of first making a perfectly practical artificial velum." Carried.

Adjourned.

THIRD DAY.—*Afternoon Session.*

Called to order at four o'clock.

Dr. C. Palmer gave a description of the manner of using his instruments for removing pulps and filling fangs. Before the introduction of a filling, he dries the canal so thoroughly that on the withdrawal of the cotton not the slightest moisture is present upon its surface, when he packs his gold with fillers of graduated sizes.

"Diseases of the Antrum, and Treatment," were declared in order.

Dr. Atkinson said that diseases of the antrum were always occasioned by inflammation. He thought it never necessary to remove a good tooth in order to gain access to that cavity, but would advocate perforation between the fangs of the teeth, as between a second bicuspid and first molar. He uses dressings of water, salt water, tinct. arnica, tinct. iodine, glycerin, iodine and glycerin, etc.; but the presence of syphilitic, mercurial, or cancroid tendencies convert it into a malignant disease and modify the treatment.

Dr. Newton said that he had a tooth removed, one fang of which perforated the antrum; he was afterward troubled with a discharge from that cavity, which he syringed with zinci sulphas and rose-water, according to the directions of his physician, but without effect, when a strong solution of nitrate of silver was substituted, to which treatment it readily yielded.

Dr. Eccleston mentioned a case where a discharge of pus followed the extraction of a bicuspid, and continued for two years; he finally removed the bicuspid and two molars adjoining which had become implicated, cut an opening into the antrum, and syringed with a solution of nitrate of silver, fifteen grains to the ounce, with a successful result.

Dr. T. Palmer mentioned a case in which he favored the discharge of pus by the introduction of a gold tube; syringed with sulphate of zinc and hypochlorite of soda, obtaining a successful result.

Dr. A. W. Kingsley described the case of his father, who had lost a large portion of the bony walls of the antrum, and was troubled with the existence of a very offensive discharge; he used port wine and tonics, internally; syringing with a weak solution of nitrate of silver, gradually increased to thirty grains to the ounce, and succeeded in effecting a cure.

Upon motion, the order of business was suspended to admit of the consideration of Nitrous Oxide Gas.

Dr. J. Allen did not advocate the use of any anæsthetic agent; but

regarded nitrous oxide as the most desirable of any that had ever been employed. He had ceased to use chloroform and ether on account of their danger; condemned the freezing process, and discarded galvanism on account of its unreliability; but regarded nitrous oxide as the quickest, pleasantest, and most uniform in its effects. It seldom requires two minutes to insure its influence, which passes off almost as rapidly, rendering several exhibitions necessary in a prolonged operation. There is some difficulty in keeping it, making it somewhat expensive, and constituting the only objection to its employment.

Dr. Searle prefers it to any other anæsthetic. He described by diagrams his method of generating it. He prefers a mouth-piece to a tube as being more cleanly; it also prevents the patient from opening the lips and allowing the gas to escape. He empties the bag every time, using fresh gas at each administration. Stated that it was not always uniform in its effects, and mentioned one case in which it failed. The patient under its influence is subject to the complete control of the operator. The following article, from the pen of Dr. Searle, communicated to the *Springfield Republican*, gives the result of his experience with this new agent:—

"MR. REPUBLICAN:—Will you allow me a word in regard to the use of Nitrous Oxide, or 'Laughing Gas,' in dental surgery?

"It may not be generally known that this agent was the first anæsthetic used for preventing pain in surgical operations. Owing to the trouble and expense of keeping it ready for use, and also to the fact that its effects were too transient for most surgical operations, it was soon superseded by ether and chloroform. A few dentists, I believe, have always given it the preference in dental surgery. The question is often asked, can you keep a patient quiet long enough to remove a tooth? In answering this question, I will give what was known and said of it fifteen years ago:—

"'The effects of nitrous oxide, when inhaled, are to cause the person inhaling it to enter with his whole soul and strength into whatever happens to impel him at the moment. Thus if taken in a frolic, he is extremely vivacious and mirthful; but if inhaled to prevent pain in surgical operations, no such appearances are manifested, the patient remaining quiet and watching its effects with as much calmness as any by-stander.'

"The experience of dentists who are now using it fully confirms the above statement, no more difficulty being found to keep the patient passive than when under the influence of ether or chloroform.

"It is also asked, is it really any better than ether or chloroform, and why do you give it the preference? I answer, it is administered with less inconvenience to operator and patient. Its effects are more agreeable to the patient. The dose can be repeated several times if necessary without inconvenience or danger. The influence soon passes off, leaving the patient feeling as well or better than before he inhaled it. Persons take it with much less fear than they do ether and chloroform.

"I have tested it in the most difficult cases of extraction, and found it as potent to prevent pain as any anæsthetic I have used. I am satisfied that its use is admissible in cases where other agents cannot be administered with safety.

"The only disadvantages are the trouble and expense of keeping it ready for use. But if it continues to give the satisfaction that it now does to those who administer it and those who take it, no humane dentist will be willing to be without it.

"I shall be happy to show my apparatus to dentists, and give any information I may be able in relation to the preparation and administration of nitrous oxide. F. SEARLE.

SPRINGFIELD, July 27th, 1863."

Dr. J. Allen said, understanding that Dr. S. S. White had had a large experience with the gas and its manufacture, he hoped that he would favor the Convention with some remarks upon the subject.

Dr. S. S. White said, he supposed the only object in calling upon him was the hope that some practical suggestions might be offered, to guard those who were without experience in the preparation of nitrous oxide gas from some mistakes they would be liable to make. The nitrate of ammonia of commerce is supposed to be often impure; care should therefore be taken to procure it of a reputable chemist. The *fused* nitrate of ammonia is much to be preferred to the crystals. The mode of making the gas for inhalation is to heat the *fused* nitrate of ammonia in a glass retort upon a sand-bath, and passing the gas through a quantity of water sufficient to absorb the nitrate of ammonia that may have passed over in the form of vapor without being decomposed. Care should be taken to avoid overheating it, as an undue temperature would cause volatilization instead of a decomposition of the salt, which would therefore be lost. The operation requires intelligence and care, but, with these, is not difficult.

Dr. Buckingham could not see in what respect it was superior to ether; its generation and the difficulty of keeping it rendered it certainly much more troublesome. The anæsthetic property of nitrous oxide gas was first discovered by Sir Humphrey Davy. He thought ether and chloroform dangerous only when given without a due admixture of atmospheric air. He would, however, advocate a thorough trial and investigation of the nitrous oxide.

Dr. Watt had not tried the nitrous oxide, but would like to see its qualities thoroughly tested. He deemed chloroform and ether safe in judicious hands; but never administered either for trivial operations.

Dr. Atkinson said that there was not a single *well-authenticated* case of death from chloroform on record; yet he never administers it without apprehension, and never passes a patient deeply under its influence for a trifling operation.

Dr. A. Hill commenced the use of ether under Morton, and afterward employed chloroform, administering it in three cases, the last of which proved so alarming that he abandoned its use, and could not now be induced to employ either again. He believed that the use of anæsthetic agents offered inducements for an unnecessary sacrifice of teeth.

Dr. J. Allen thought the argument that anæsthetics would promote a

wholesale slaughter of teeth was simply an assumption not borne out by facts. It seemed to him unreasonable that any such result should be induced by the introduction of an anæsthetic agent into the hands of a *scientific and educated* profession.

Dr. W. B. Roberts offered the following:—

Whereas, This Convention, having for its object the elevation and advancement of our science, desire on all occasions to recognize, indorse, and to give encouragement to those of our numbers who contribute most largely to the progress and perfection of our noble art; and

Whereas, Dr. Norman W. Kingsley has this day presented and demonstrated to this Convention his peculiar method of restoring artificially the lost palate and velum, in a manner so clear and comprehensive as to entitle him to a substantial testimonial from this Convention; therefore

Resolved, That this Convention present to Dr. Kingsley a gold medal as an expression of their high appreciation of his valuable contribution to our profession.

Resolved, That a committee of five be appointed by the Chair to carry out the object of this resolution, with power to draw upon the Treasurer for an amount not exceeding fifty dollars. Carried.

Adjourned.

FOURTH DAY.—*Morning Session.*

Called to order at nine o'clock. The minutes of the previous meeting were read and adopted. The next subject for discussion was "Alveolar Abscess."

Dr. Atkinson dwelt upon the importance of a thorough consideration of the subject, and gave a general analysis of the principles of alveolar abscess.

Dr. Dwinelle thought the matter too much magnified, thus rendering a simple subject unnecessarily obscure. Diseases of the antrum are equally amenable to treatment when the cause of irritation is removed, yet its nature is not so thoroughly understood by the medical profession as by the specialists of dentistry. In a case of ordinary alveolar abscess, he dries out the pulp cavity and fills it with creosote, introduced drop by drop on the end of a cotton-wound broach. This he injects through the apicial foramen by forcing upon a gutta-percha plug placed over the orifice. He said that alveolar abscess was well understood twenty years ago, although great improvements had since been made in the treatment.

Dr. W. B. Roberts described a case of alveolar abscess which he treated, filling with gold around a pivot of platina introduced into the root. The operation was completed six years since, and is still doing well.

Dr. Buckingham said that, like Dr. Dwinelle, he was in favor of simplification. He thought that during the last twenty years rapid advances had been made in solving the nature and treatment of alveolar abscess.

Dr. W. B. Roberts mentioned a case of fang filling performed by Dr. Hudson, of Philadelphia. It lasted forty-five years, when the crown broke off, and the case falling into his (Dr. R.'s) hands, he afterward pivoted upon the remaining root.

Dr. Hawes was much better acquainted with the subject than he was

some time since; was surprised to learn that alveolar abscess was so thoroughly understood twenty years or more ago, and referred to the fact that an educated man like Dr. Harris, in his work, suggested extraction as the treatment.

Upon motion, the consideration of "Mechanical Denistry" was taken up.

The President announced the following committee on the introduction of dentists into the army: Drs. S. S. White, B. T. Whitney, and Geo. Watt.

Dr. Dwinelle said that Dr. Holmes had suggested a method for avoiding the disagreeable heating effect which vulcanite produces upon the gums of some individuals. He drills holes through the rubber plate, fills them with gold wire, smooths and polishes; or vulcanizes with an air chamber of gold plate. It operates upon the principle of conduction, and has proven very effective.

Dr. Holmes described a case which he had relieved in this way.

Dr. S. B. Palmer described his own case, where, three weeks ago, he had rubber substituted for gold. It excited the disagreeable heat referred to, and rendered the roof of the mouth insensible to the impression of cold upon taking ice-cream. He believed that in proportion to the amount of metal would this difficulty be obviated.

Dr. J. A. Perkins condemned rubber in any form, and objected to the difficulty of obtaining a perfect contour and articulation with the teeth manufactured for such work.

Dr. Hawes liked the rubber very much, and never saw more than one or two of his patients who would not pronounce in its favor.

Dr. Whitney appreciated Dr. Holmes' method of overcoming the heat, and thought it was induced by the irritation occasioned from drawing the mucous membrane into the air chamber. He condemned air chambers, and believed them worse than useless.

Dr. Goldey never uses air chambers in entire sets, but in partial cases is obliged to resort to them.

Dr. W. B. Roberts said that he regarded the employment of base material incompatible with the attainment of perfection in mechanical dentistry, for good materials are necessary for the accomplishment of good work.

Dr. Butler would advocate no particular base, but thought all were good in certain cases; he regarded the beauty and utility of work as dependent more upon the arrangement of the teeth than upon the nature of the base employed. He could see no necessity for the introduction of gold pins in rubber plates. Why not leave the holes open, if ventilation is required?

Dr. J. Allen thought that rubber was far below gold in merit, and its use had reduced the standard of artificial work. He referred to the importance of avoiding all spaces and crevices for the accumulation of food, a result accomplished by the employment of continuous gum. He knew

it to be the most perfect work, and capable of easy repair; he was aware that its weight was urged as an objection; this, however, he deemed of no consequence, since no effort was necessary to retain it in place until its weight exceeded the atmospheric pressure of fourteen pounds to the square inch.

Dr. Butler indorsed the highest order of work, and thought continuous gum was included in that class.

Dr. Whitney mentioned a case in which a perforated plate was worn to the perfect satisfaction of the patient.

Dr. Peirce described the practice of the late Dr. Reynolds, of Philadelphia, who left an opening almost entirely around the margin of the suction cavity, a small tongue remaining to connect it with the plate.

Dr. J. Allen advised against the extraction of lower teeth, for when worn down the most perfect result is accomplished by capping them with the artificial work.

A vote of thanks was tendered Dr. Allen for the exhibition of his artificial case.

Dr. Sheppard described a pair of new shaped calipers, designed to pass into places where with the old ones it is impossible to reach; their peculiarity consists in having the beaks at one end turned inward.

Dr. C. Palmer admired continuous gum work; he spoke of the importance of a proper articulation and restoration of contour.

Dr. T. Palmer had considerable experience with continuous gum, and regarded it as the *best* work; rubber, however, he thought, filled a gap in the list of materials for artificial bases.

Dr. E. A. L. Roberts referred to the formidable nature of the first vulcanizer, and the many improvements, down to his own patent of a one-chambered apparatus. He said that he was the first to spin a copper boiler.

Dr. Goldey thought the best artificial work would meet with condemnation from some source; he constructed a case in a mould, taken from a natural set, and yet objectionable features were urged; he would like the establishment of a standard or type for artificial dentures.

Dr. N. W. Kingsley thought it impossible to establish a standard for beauty, since it must be regulated by individual taste.

Dr. Robins prefers wax for artificial trial plates.

Dr. Whitney uses a mixture of white wax without tallow and Venice turpentine, five parts to one, by weight, melting over a gentle fire; dips and redips, with a wet shingle, three or four times, and immerses in cold water, when the wax separates in the form of sheets.

Dr. Sylvester prefers glass for dipping, as the wax separates more readily.

Dr. Williams uses thin muslin dipped in wax, and retains the teeth to the temporary plate by a mixture of gum mastic or sandarach and wax. If tin is used in vulcanizing, and adheres to the plate, he removes it by rubbing the surface with mercury.

Dr. Sheppard envelops the wax between two layers of tin, to prevent its sticking to the model, and also to increase its stiffness.

Upon motion, the regular order of business was suspended, and a reconsideration of the next place of meeting entered upon.

After many suggestions, and much discussion, Detroit was selected for the reassembling of the Convention, on the first Tuesday of August, 1864.

Miscellaneous business was then in order.

Dr. Atkinson read two papers, one upon "Anomalous Cases,"* and the other upon "Causes Retarding Dental Progress."†

The following gentlemen were announced as a committee for the preparation of the Kingsley medal: Drs. W. B. Roberts, A. C. Hawes, J. Allen, W. H. Atkinson, and W. H. Dwinelle.

The President then made a short and spirited address, in which he impressed the importance of popular education in dentistry, and condemned the practice of keeping the public in ignorance upon such subjects. The best class of patients are those who know the most; they recognize the value of their teeth, seek the highest dental skill, appreciate good work, and thus stimulate a practitioner to the performance of a high order of operations; on the contrary, nothing will so quickly dampen the ardor of an operator and engender carelessness as an inappreciative patient. He referred to the channels for imparting this knowledge to patients, by conversation employed at the proper time and in the proper way, by popular journalism, and by fugitive pieces *legitimately written* for the press. He gave the subject its deserved importance, and was listened to with much attention. Adjourned.

EDITORIAL.

DENTAL SOCIETIES.

It is doubtless true that dental societies have done a vast deal of good for dentistry; but we believe they could be productive of still more good. The old American, as it is called, has gone out of existence, and yet it was made up of some of the best men that were ever known in our art. The first blow it received, and which shattered it to the centre, was the "amalgam pledge." While it was perfectly proper for any member belonging to the society to oppose amalgam if he believed it to be a contraband article, it was not good policy, or in conformity with social conventionalisms, to form a clique with a view to spring a trap upon any members who could not dress in line on an open question in practice. It would have been much better for all concerned, and in keeping with the proper objects of association, to have taught the unbelievers a better practice, instead of visiting upon their devoted heads a disgraceful punish-

* See page 66. † This article will appear in the next number.

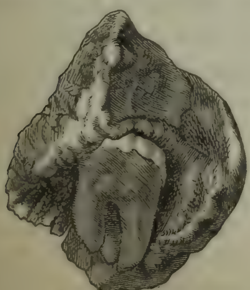
ment. The moment a society adopts an ultra idea, that moment the wedge of separation is entered.

We have given, perhaps, as much time as any one in the profession in helping to make constitutions, by-laws, rules of order, etc. for dental societies, and, doubtless, we have helped to make some good ones as well as some very bad ones; but we believe that a mere order of *conducting business* would better subserve the wants of associations than all the finely-wrought principles of constitution and nicely balanced by-laws. Properly cultivated social feelings are the only safeguards to the harmonious operations of any society, except where only pecuniary interests are to be subserved. If a member must be held by any other law, he is like a fish on a hook, which will flounder about until it breaks the hook or dies in the struggle. The object of a society should be to enlighten its members in professional matters, and in social relations. Where restriction begins, interest in individual members ends. The more you attempt to govern by hard lines, the farther apart members are separated, until the society dies or is broken into fragments.

If a society adopts a constitution and by-laws and lets them alone, perhaps it would do very well; but nearly every new member who enters a society thinks he must have the constitution or by-laws altered if they do not meet his individualism. We believe the dental convention system is the best idea that has yet been hit on for dentists. If let alone to their own inclinations, they settle into a degree of harmony and interest for each other, which could not be accomplished by any fixed law. The only objection we have to it is the time of year it holds its meetings; we cannot attend. The last week in August or first week in September would be much better. We do not mean, however, to contend for it, but it deprives us of a vast amount of pleasure. J. D. W.

SALIVARY CALCULUS.

It is astonishing to what an extent this substance will sometimes form on and around the teeth. It is incident to temperament, periods of life,



etc.; but it is also favored by geographic locality. Some localities favor biliary and urinary calculi, and doubtless the salivary also. The accom-

panying specimen was sent to us by Dr. C. J. May, of Warsaw, Illinois. It is the largest we have ever seen. It is of the white variety, and weighs, with the tooth imbedded, seven dwts. Troy. J. D. W.

REVIEW OF DENTAL LITERATURE AND ART.

BY J. H. M'QUILLEN, D.D.S.,

PROFESSOR OF ANATOMY, PHYSIOLOGY, AND HYGIENE IN THE PHILADELPHIA DENTAL COLLEGE.

American Dental Association.—It is with feelings of more than ordinary pleasure that attention is directed to the fact that, contrary to what might have been anticipated at such times, viz., the rebel invasion of the North, active operation of the conscription act, and the riotous conduct of Northern sympathizers with the rebellion, the third annual meeting of this Association, which was held in Philadelphia during the latter part of August, was, due to the exertions and self-sacrificing devotion of earnest laborers in different parts of the country, largely attended by representations from the various local dental societies.

The attendance at the previous meetings was very limited, and the prospects were that such would continue to be the case for some time to come, for the Association has had many difficulties to contend with. It was organized at a period when the causes which led to the present national troubles were culminating, and these have shook every institution in the country to their base, and crushed many a noble enterprise which has not had sufficient vitality to stand such an ordeal.

In addition to these causes, the objects and aims of the organization have been misunderstood by some, and studiously and persistently misrepresented by others, and in this way many desirable persons have been induced to hold aloof from it.

For a brief period, such efforts may meet with a certain amount of success in opposition to any enterprise, but sooner or later, if the movement is a good one, and its promoters and supporters have the requisite ability, energy, consistency, and determination to maintain its vitality during the early and most trying period of existence, a reaction correspondingly beneficial to the organization will eventually take place in the minds of those who have perhaps been most opposed to it, when they become fully and clearly acquainted with its objects, aims, and capabilities.

The individual or institution which escapes, or, when tried, cannot bear misrepresentation and opposition, has very little of the temper or backbone which is demanded in effecting the progressive movements of the age. Such things may crush the weak, the timid, and the irresolute, but

they only serve to invigorate and strengthen those who are firm of purpose, and whose principles of action are based upon the unwavering convictions that their cause is not only just and proper, but its promulgation and establishment are imperatively demanded by the requirements of the times.

The proper response therefore to misrepresentation is *work;* earnest, effective, and unmistakably progressive in its character. "The tree is known by *his* fruit." And so it is with men and institutions. To move steadily forward in a laudable undertaking, animated by a sincere desire to increase the boundaries of human knowledge and the avenues for the relief of suffering humanity, indifferent alike to unmerited praise or censure, neither weakened by the one nor intimidated by the other, is far better than to waste time, talents, and energies in useless and unprofitable controversies. The air may be thrown into vibrations by a few mouthfuls of articulate sound by those who place a higher estimate on their own opinions than others are willing to accord to them, or page after page of nonsense may be published by some poor fellow who is constitutionally and incurably afflicted with *cacoethes scribendi*—but what then? Sooner or later the vibrations of the air will cease, and the published matter will be used in various ways as waste paper. The time and occasion may arrive when it becomes proper and necessary to make a simple statement of *facts* in refutation of erroneous assertions, and then it should be done in a clear, unmistakable, and incontrovertible manner.

The American Dental Association has passed through such an ordeal, and come out of it with an indication of vitality and strength which gives a fair promise of future usefulness and prosperity.

Resting as this organization does upon a representative basis, its advantages and beneficial influences are not confined merely to its members, but extend to every local society connected with it, and through them to the community at large. The members of the Association not only come together annually, each bringing with him the past year's experience in practice, and the discussion of subjects in the local societies, but also on returning to their respective sections, they carry with them to their fellow-members of the local societies the rich results of their conference with the delegates to the national association. The national and local societies in this way react upon each other, and with decided advantage to the community, the profession, and associated effort generally.

In addition to this, no organization can exercise a more powerful influence upon dental education and dental literature, or bring about promptly and effectually such modifications and improvements as may be demanded in each.

DENTAL COLLEGES.—The eighteenth annual announcement of the Ohio College of Dental Surgery has been received. During the past year

several changes have been made in the faculty, Professors Taylor and Taft being the only members of the former organization remaining connected with it; Professors G. E. Jones, H. K. Smith, H. A. Smith, and E. Collins are, however, well known to the dental profession in the West. Prepared as this faculty is to afford a thorough course of theoretical and practical instruction, they have every right to look for a fair attendance of students during the next and future sessions. Situated as the institution is in the centre of the great Mississippi valley, which contains within its limits a large body of dental practitioners who count by thousands, it is reasonable to infer that the day cannot be far distant when its classes will range from one hundred upward.

There are now four institutions in this country, one in Baltimore, one in Cincinnati, and two in Philadelphia, established with the view of preparing those who are disposed to enter the ranks of the dental profession, in a manner which will enable them, when engaging in practice, to render valuable service to those who come under their care as patients, and at the same time, through their scientific attainments, to reflect credit upon the profession they have selected.

A few well-meaning persons, whose acquaintance with the subject, however, is manifestly quite limited, and whose views are correspondingly contracted, may conscientiously believe that there is no occasion for two schools in one city, particularly as the attendance heretofore has been limited; but they certainly have no show of truth or justice in asserting that it is "not only unnecessary, but detrimental to dental education," to establish an institution based upon proper principles and with a well-organized faculty.

When it is remembered that but a small portion of the annual additions to the ranks of the profession have enjoyed the advantages of a collegiate education, it will be readily seen that there is a much larger number to be instructed than even the present schools can accommodate. There is no reason, however, why this condition of affairs should continue to exist, and if the proper steps are taken, it will eventually be the *exception*, and not the *rule*, when any one will presume to enter upon the practice of dentistry merely with the information received from a private preceptor. For it matters not how well informed, scientific, ingenious, and skillful the latter may be, he cannot supply the place of the systematic and varied course of instruction which constitutes the curriculum of a regularly established school. And the deficiences of the student educated under such circumstances, can only be made up, if they ever are, by subsequent exertions on his part, and possibly at a period when he can least afford to be so employed.

Years ago the vast majority of medical practitioners in this country were educated in private offices alone; the establishment of colleges throughout the land, however, has completely revolutionized that system,

much to the advantage of medical instruction and medical practice; and it is reasonable to infer that a similar result will be realized ere long in the education of the dental profession.

That the *entire* profession may be awakened to the *advantage* and *necessity* of a thorough course of instruction in dental colleges, it is important that the respective institutions should be so organized and managed as to command the unqualified respect of the *profession* and the *community at large.* For then not only the *profession*, but *patients* will demand that the dentist shall have received a collegiate education.

If it is important that the student should be thoroughly educated, how much more important is it that those to whom his instruction is intrusted should be duly qualified by natural endowments, varied attainments, and extended experience, to meet all the requirements which he may properly and justly demand of his preceptors!

The qualifications and obligations of a public teacher cannot, indeed, be too highly estimated; for the responsibility is fearful. As an eminent writer has truly said, "doctrines and maxims, good or bad, flow abroad from a public teacher as from a fountain, and his faulty lessons may become the indirect source of incalculable mischief and suffering to hundreds who never even heard his name."

Not only is it important that teachers should be fully qualified for their positions, but it is also a matter of very great moment that the most thorough illustration should be made by means of preparations, models, diagrams, etc. of every subject capable of such treatment; in other words, to address the eye as well as the ear. Indeed, all the senses, or every avenue to the brain that can be employed, should be made use of to secure a clear and perfect conception on the part of students.

These and many other things are required on the part of each institution to bring about the unqualified confidence and support of the entire profession.

Viewing the subject in this broad light, it will be seen that there is work enough and room enough for all, and if each faculty only labors zealously to bring their institution up to the highest possible point of excellence, it will not be in the least degree "detrimental to dental education," but, on the contrary, is calculated to improve and benefit all by inducing a desirable and commendable spirit of advancement and improvement.

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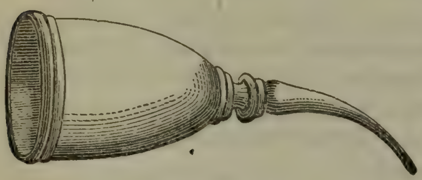
PHILADELPHIA SCHOOL OF ANATOMY AND OPERATIVE SURGERY.— For the information of such as may design to attend the anatomical lectures at this institution the coming winter, it will be interesting to know that the balance of the summer term, which recommences after the recess September 1st, may be attended under the winter ticket. This gives seven months of continuous lectures for the one fee of $10.00. The win-

ter course, both on anatomy and surgery, commences October 12th. Tickets can be procured of Dr. Jas. E. Garretson, 1537 Chestnut Street, Dr. D. Hays Agnew, 16 North Eleventh Street, or from the Janitor at the school.

DENTAL REGISTER OF THE WEST—JUNE.

"AN EXTENSION THIMBLE.—The accompanying cut represents an extension which we have had made, to be used upon the index or middle finger of the left hand. It is employed to aid in holding the napkin, paper, spunk, or whatever may be used to prevent the encroachment of saliva. The point of this instrument can extend into the mouth when the finger, either on account of its size, or for want of length, cannot go. It may also be used occasionally to hold down a piece of gold till it is made fast in the proper position. We find it so frequently applicable that we would hardly know how to get along without it. In filling the teeth of the left side, both above and below, it is decidedly advantageous. It will reach over and draw the napkin up firmly against the lingual sides of the teeth. There are points of two or three different forms and sizes which may be attached, as there is a screw joint at the collis. Any worker in precious metals can make them."



PEOPLE'S DENTAL JOURNAL—JULY.

"FRUITS: WHAT THEY CONTAIN, AND WHAT THEY ARE FOR.—The luxuriance of summer brings to us a great variety of fruits, which, like all other kinds of food, have intimate relations with the health of the entire body, and especially of the teeth.

"From all time, artists and other lovers of beauty have paid attention to the colors of ripe fruits, but it is only in later years that chemists and microscopists have paid attention to their structure, composition, and uses. An examination of the internal structure of fruits shows us some of the most beautiful objects in nature. That which appears to the naked eye as a solid, homogeneous mass, filling the interior of an apple, pear, or watermelon, expands under the microscope into a vast storehouse, piled to the roof with the most exquisite little crystal globes, some perfectly clear and brilliant like the purest diamonds, and others flushed with rosy or amethystine stains. Each of these globes is a sealed flask full of the juice of the fruit.

"Every agreeable fruit contains three principal elements, upon the proper combination of which its attractiveness depends. These three are an acid, a sugar, and a flavoring material.

"The acids contained in fruits are numerous, but the principal are the citric, malic, and tartaric acids.

"The citric acid is that which exists in the orange, lemon, cranberry, raspberry, strawberry, red currant, and many others. When extracted, it is a transparent crystalline solid, intensely sour, and without a particle of flavor. It is much used by physicians to make sour drinks for the sick.

"The malic acid is that which is contained in the apple and pear family. The tartaric acid is the sour principle in grapes. After the wine is pressed out, a portion of the tartaric acid unites with the potash in the grape, and settles to the bottom of the cask in a solid form called tartar. From this the tartaric acid of commerce is extracted, and used both in medicine and cookery. It closely resembles citric acid, but is more harsh to the taste.

"These acids are capable, by long-continued application, of dissolving the solid substance of the teeth, and were there no provision of nature against it, we should pay for our enjoyment of fruit by the inevitable loss of these organs. It is the first faint traces of this corroding action which causes the teeth to feel rough and 'set on edge' when very sour substances are eaten. For the same reason, a long-continued excess in eating sour fruit causes tenderness of the teeth. There is a curious provision of nature, however, by which healthy constitutions protect the teeth from this result.

"Ripe fruits contain not only acids, but also a small portion of potash. When taken into the stomach, the acid, being a vegetable compound, is digested and destroyed, and rendered no longer an acid but nutritive material. The potash, on the contrary, being a mineral substance, cannot be thus destroyed, but is absorbed into the blood and circulates to every part of the system, rendering the blood alkaline. The alkalies of the blood being thus abundantly furnished to the salivary glands, insure a constant alkaline character to the saliva, which flows into the mouth and instantly neutralizes any acid which the fruit may have left upon the teeth. This singular provision of nature, however, is perfect only in persons of good digestion. If the stomach is feeble, or the indulgence in fruit very excessive, the acids of the fruit are not destroyed: they pass into the intestines and are absorbed into the blood, diminishing its alkaline character, and depriving the saliva of its neutralizing elements. In such cases, the fruits exert a directly injurious effect upon the teeth. Hence, one reason why a disordered stomach is apt to be accompanied by decay of the teeth.

"The second class of ingredients in fruits consists of the sugars. Of these there are a variety, mostly belonging to the grape sugar variety. They are nutritious and agreeable, and directly promotive of good health, and do not differ materially in their effects from cane sugar.

"The most interesting topic connected with fruits is the study of their flavors. Every plump, ruddy-cheeked berry is a chemical laboratory, in which little retorts of purest crystal and amethyst distil their delicate ethers, on the same principle that the professor does in his laboratory.

"All the finest and most delicate flavors of fruits consist of ethers closely similar in nature to the ether and chloroform used by dentists and surgeons in surgical operations. These vegetable ethers not only resemble that used in surgery in their composition and nature, but also in their effects on the system. The flavor of the pear, the pineapple, or the strawberry, if concentrated in large quantities, is capable of producing the profound sleep of chloroform, so that any surgical operation could be performed without the patient's knowledge. It might be even given to such excess as to cause a tranquil death; and, although to

'Die of a rose in aromatic pain,'

is a poetic fiction, a man might die of the aroma of a strawberry without a particle of pain. In small quantities, these ethers are gentle stimu-

lants, slightly exhilarating the feelings of the patient and soothing some varieties of pain. As inhaled from or eaten with the fruit, the stimulant effect is scarcely perceptible, only serving to produce a delightful flavor and to gently excite to action the nerves of the digestive system.

"Ethers are produced by chemists in the following manner: an acid and some alcohol are placed together in a glass retort, and by the action of one upon the other, the ether is produced and distilled over in a fragrant vapor. The process of the ether manufacture in the fruit is the same in principle, only differing in the apparatus. The little crystal cells or globes inside the fruit are filled with a solution of acid and sugar. Between the cells are innumerable spaces through which the air circulates. The oxygen of the air, acting upon the sugar of the cells, converts very minute portions of it into alcohol. The acid of the cell instantly converts the alcohol into ether, which, being very volatile, exhales as a delicate fragrance into the air.

"The fragrance of many fruits can be produced in the laboratory without a particle of the fruit itself being used in the operation. This manufacture is carried on by distilling various kinds of acids with alcohol and similar compounds. A great variety of ethers can thus be made, each having its own peculiar flavor, and the manufacture of them has already become of considerable commercial importance. So perfect are some of the articles, that confectioners prefer them to the natural product for flavoring confectionery, the flavor made by art being actually more fruity than the fruit itself.

"The following are among the articles most commonly manufactured:

"Butyric ether—flavor of pineapples. Made by the action of butyric acid upon alcohol.

"Acetate of amyl—flavor of pears. An ether made by the action of vinegar upon an organic product.

"Valerianate of amyl—flavor of apples. An ether made by the action of valerianic acid. This is manufactured and sold for the purpose of producing an apple flavor in whisky vinegar. The vinegar thus 'doctored' is sold for genuine cider vinegar.

"Œnantic ether—flavor of grapes. An ether made by the action of œnantic acid upon alcohol. It is used very extensively in one form or another in giving a grape flavor to artificial wines and brandies.

"By various mixtures of these flavors, good imitations of strawberries, raspberries, etc. are produced. Nearly all the syrups used at second-rate soda fountains are flavored with these artificial ethers, and do not contain a drop of the juice of the fruit which they represent.

"Owing to the fact that the natural fruits generally contain delicate mixtures of several ethers at once, it is seldom possible to make a perfectly exact imitation of the flavor; hence, nearly all these spurious syrups and wines can be detected by a practiced palate.

"Another flavoring material found in many fruits consists of the essential or volatile oils, such as the oil of lemon, the oil of orange peel, and many others. This class of flavors is less delicate and more pungent to the taste than the former. They are prepared for separate use by distillation from the fruit.

"The fruits of the peach and cherry family contain a peculiar flavor, which, when examined, is found to be nothing else than the deadly poison, prussic acid. It exists, however, in such minute quantities, that it has no evil effect. Its action upon the system is directly the opposite of the

ethers, they being stimulants, while the prussic acid is a sedative, and promotes a languid, soft pulse, and a slow beating of the heart.

"Practically, then, fruits are highly beneficial to persons of good digestion. In proper quantities they furnish alkalies to the blood and saliva, which protect the teeth from the action of the acids. These alkalies, also, are natural stimulants to the liver, so that the steady use of fruits tends powerfully to prevent summer bilious attacks. The summer fruits, therefore, are, to a certain extent, the natural antidotes to summer diseases. Fragments of fruit skins and pulp sometimes lodge between the teeth, and, acting as a sponge to absorb and retain acids, keep these corroding juices in contact a long time with the enamel, ultimately penetrating it and causing decay. To obviate this evil, one only needs to remove all such particles, after eating, with the tooth brush or pick.

"Finally, let all eat with reasonable freedom the ripe fruits and enjoy the delicious flavors which the Maker of all things has prepared for the promotion of health and enjoyment. A sound instinct points out this course to us, and the teachings of science confirm its mandates."

PERISCOPE OF MEDICAL AND GENERAL SCIENCE IN THEIR RELATIONS TO DENTISTRY.

BY GEO. J. ZIEGLER, M.D.

"*Popular Medical Errors.*—Certain diseases are generally supposed to be the inevitable lot of children. Most parents think that their children 'are born to have measles, hooping-cough, perhaps even scarlet fever, just as they are born to cut their teeth, if they live.'* That the majority of children *do* have at any rate the first two of these diseases (and that a respectable percentage of them die in consequence) is a fact; but that children *must* have these diseases we know to be an assumption, and a very false one too. Children catch these diseases simply because parents and guardians do not observe those sanitary precautions which will guard them against the contagion. What those sanitary precautions are, no one has shown more clearly and forcibly than that lady whose words we have just quoted.

"Speaking of teething, this reminds us of another popular error. Parents anticipate this period as one apt to be accompanied with more or less suffering, and even danger for their children. So far they are right. But when, as is usually the case, they regard the process of dentition as the *cause* of the diseases and derangements which may happen to coexist with it, they are wrong. It is not so much their cause as their occasion. Teething children are peculiarly subject to these diseases and derangements, not because their teeth are piercing their gums, but because the period of teething is one of active growth and development, and therefore of peculiar susceptibility to disturbing causes.

"Children of tender years, and even tender constitutions, are sometimes made to rough it, as the saying is, *i.e.* to endure exposure to cold, etc., more or less inadequately clad, under the impression that they will thereby grow up all the hardier and stronger. The mistake is a cruel one, and apt to tell most injuriously on the child's health and strength. It gen-

* Miss Nightingale's "Notes on Nursing," p. 20, 1st ed.

erally arises from ignorance of the comparatively small power which children have of resisting cold—in other words, of maintaining an independent temperature. Such a system of child-nurture, if universally adopted and pushed to an extreme, would perhaps not be without its advantages. While the feeble and sickly would generally die, the strong and healthy alone would generally survive; and thus, in the course of a generation or two, supposing the usual conditions of health to be observed, Englishmen would attain a high degree of physical vigor. Perhaps the fondest dreams of the muscular Christian would be soberly realized. The old Romans tried the experiment, and their poets were forever harping upon the *durum a stirpe genus*, which was the result. Of course the means whereby the result was attained never struck them as savoring somewhat of barbarity. Statistics of child mortality were not kept in those good old times.

"Another great physiological truth, ignorance or disregard of which is sure to entail bad consequences, is the necessity for children (and adults as well) of a diet always wholesome, but still not too monotonous. Some parents try to rear their children on what they fancy to be a faultless diet. They allow them plenty of bread, milk, butter, meat, and potatoes, but rigidly withold 'trash,' such as pickles and sweets of all kinds, perhaps even fresh fruits and green vegetables. For a time this diet answers well enough, but by-and-by, to their surprise, their children, so far from thriving better, thrive worse than those who have been allowed to eat and drink pretty much what they like. Their diet, in so far as it contained a due proportion of nitrogenous, non-nitrogenous, and inorganic principles, was wholesome enough; but inasmuch as persistence in it did not afford that *variety* of aliment necessary to healthy nutrition, it became positively unwholesome. Dyspeptics and valetudinarians often make the same mistake, and with the same result. They over-diet themselves, lose flesh, get costive bowels, and become hypochondriacal to the last degree.

"There is a host of popular fallacies about different medicinal remedies. We shall consider merely a few of the more important. Camphor and fumigations, such as pastiles, burnt vinegar, the smoke of tobacco, and even of brown paper, still enjoy great repute as deodorizers and disinfectants. The public do not appreciate, first, that such remedies as these do not destroy (*i.e.* chemically decompose) a smell or miasm, but merely overpower and mask it; secondly, that even those remedies which *do*, such as charcoal, chlorine, etc., are at best mere makeshifts, the only way to maintain a pure atmosphere being free ventilation and removal of the *cause* of the smell as well as of the smell itself. Such new-fangled doctrines run counter to long-established customs. They are inconvenient truths which rich and poor alike are slow to believe, slower still to act upon. Literally as well as metaphorically, people prefer the time-honored maxim of not stirring stinks. A stink is a nasty thing to have to remove, and the task of its removal is by no means sweetened by the uncomfortable reflection that the nuisance was (most likely) wholly preventable. * *

"The vulgar notion that chalybeate medicines cause caries of the teeth sometimes proves a nuisance when we want our patient to continue their use. He is taking steel, and his teeth are 'going'—conclusive evidence to his mind that the steel is destroying his teeth. He suspects us of refining when we try to make him understand that the caries of his teeth depends not upon the medicine but the defective nutrition which it is intended to remedy. The prejudice against calomel, or mercury in any

form, on the ground that it ruins the teeth, is much stronger, though scarcely better founded, than the prejudice against steel. A cachectic child, with occasional attacks of gastric derangement, is ordered occasional and appropriate doses of calomel; at the same time its teeth happen to be 'going'—just as they 'go' in similarly ill-conditioned children who may have never taken a grain of calomel at all. Mamma and nurse, as a matter of course, denounce the calomel as the cause of the caries, blame the doctor for prescribing it, then perhaps take the child to some ill-educated dentist, who is pretty sure to confirm their groundless and unjust assumption. Or again, perhaps (a most improbable supposition) the calomel has been really abused, and given to such an extent that the gums have sloughed, the teeth loosened, and some of them even dropped out. Surely here, they will say, is pretty conclusive evidence that calomel *does* ruin the teeth. But the truth is that these teeth are not necessarily unsound. Often they are not decayed at all. They get loose and drop out, just as they do in old age, because there is not gum-substance enough to hold them in—with this difference, however, that the loss of support is due in old age to atrophy; in over-salivation, to actual destruction of the gum-substance. That calomel, if given in excessive quantity, will cause salivation, and that in profuse salivation teeth are apt to be lost, no one can be foolish enough to deny: we simply maintain that in the loss of the teeth calomel has by no means that direct agency which is popularly attributed to it."—(*Med. Times and Gaz.*)

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"*Physiological and Pathological Pus.*—M. Jules Guérin thus sums up the doctrine he has been so long working at: 'There is a fundamental difference between pus secreted by wounds and pus furnished in different morbid collections. In the former case it is modified blood; the return of this fluid and the elements which compose it to their normal condition, it is *physiological* pus. In the latter it is a contaminated fluid, changed by the morbid elements of which it is the vehicle—it is *pathological* pus. Physiological pus possesses, like the blood, a kind of vitality, while pathological pus is a dead, excrementitious product, susceptible in the highest degree of undergoing putrefaction. This great and important difference is especially appreciable with respect to traumatic abscesses and cold abscesses, constituting collections. The former require to be opened as soon as possible, and such opening ordinarily leads to no inconvenience; while the latter, on the contrary, are innocent only as long as they are sheltered from the air, their opening almost constantly giving rise to putrefaction of the pus, and exposing to the danger of purulent intoxication. The differences are therefore not merely nominal. Numerous investigations have shown that the decomposition of the pus is especially due to oxygen, hydrogen, and nitrogen, carbonic acid taking little part in this. Putrefaction, properly so called, results from the presence in the air or in the pus itself of dead organic elements acting as ferments.' These different considerations led the author to establish his *subcutaneous method* of treatment, or treatment by *occlusion.*"—(*Gazette Medicale* and *Ibid.*)

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Elastic Ligatures for Removal of Pediculated Tumors.—"M. Adolph Richard, at the recommendation of M. Trousseau, has recently been experimenting on the removal of pediculated tumors and analogous growths by the employment of an elastic ligature, formed of a

caoutchouc thread. In the seventeen cases in which he has employed it, it has answered its purpose admirably, and he considers it as very preferable to the ordinary ligature. Its action is more continuous, and never ceases until the end to be attained is accomplished, while the pain after a few hours is insignificant, and the healing process afterward is a very rapid one."—(*Ibid.*)

"*Drainage from Wounds after Exsections.* By S. I. RADCLIFFE, M.D., Act. Assist. Surg. U. S. A., U. S. General Hospital, Annapolis, Md.—It is often a source of great annoyance that the surfaces of wounds close over, encircling large cavities inclosing abnormal discharges, which are in many cases the cause of extensive sloughing and great destruction of surrounding tissues. The use of drainage tubes, it seems to me, would facilitate very much the discharge, act as a tent, and render extensive incisions to empty such accumulations unnecessary.

"It seems, however, there may be some objections urged against their use. We have not used them, and of course cannot speak from experience; all we may say is therefore entirely suggestive. We think they may be an inconvenience, if not an annoyance or direct pain to the patient, by infringing upon parts made quite sensitive by the operation, probably upon nervous filaments or denuded nerves; or they may be a superadded irritant to the wound, may act as any foreign body, and may result in active inflammation. They may be inconvenient and troublesome to the surgeon or attendant by the difficulty in retaining them in position, by constant removal and readjustment, by their tendency to become foul, and from the incompleteness of the drainage.

"We think there is a better method, and one which we have seen and employed in this hospital with great advantage—one, we think, less liable to objection, and will meet all necessary indications—that is, by suction, or by withdrawing the discharge with a syringe. This plan was introduced in this hospital by Surgeon B. A. Vanderkeift, U. S. V., in charge; and from its entire eligibility and fitness, and the singular completeness with which it operates, I am induced to regard it *par excellence,* especially in resections where the part resected is required to remain immovable or in a quiescent state for a considerable period after operation, in order to form strong union or firm adhesion of the contiguous parts. The nozzle of the instrument may be introduced at any orifice of incision or in the original wound, and its liquid or semi-liquid contents drained, and at once and completely. Its performance is so simple that any assistant or attendant may use it with the greatest ease, subjecting the patient to no pain, and causing no disturbance of function or healthy action in the part, or hæmorrhage; and so convenient that it is attainable at all times, and may be always ready for use. Indeed, it is so simple that we need not attempt an explanation of it. It requires no directions, as any one at all conversant with the instrument can use it with the greatest facility. A syringe of almost any size or kind may be used, so the aperture in the nozzle is sufficiently large to admit the drainings; one of metal is better than one of glass, as it is not so liable to be broken. The piston should be well fitted, work smoothly and evenly, and it should be kept clean by occasionally rinsing with clean water."—(*Amer. Med. Times.*)

"*Fracture of Lower Jaw, treated by Intra-Dental Splints.*—DR. AUSTIN L. SANDS read before the New York Academy of Medicine the

following case of fracture of the lower jaw, and exhibited an improved apparatus for its cure. Within the past two months I have had under my observation and care a case of fracture of the lower jaw. The means used for the cure being, as far as I know, entirely novel and perfectly successful, I have taken the liberty of presenting them to the members of the Academy.

"Mr. J. P. Gunning, the gentleman receiving the injury, is by profession a dentist, and a thorough knowledge of his profession enabled him to devise and execute the means used for his cure.

"Some time before receiving the injury, he had mentioned to me his plan for securing a broken jaw, and I had promised, in case of meeting with such an injury, to try it. It so happened that Mr. G. was the first to receive the benefit of his ingenuity, fracturing his lower jaw by being thrown from his horse. The fracture extended from the right canine tooth obliquely to near the symphysis. The soft parts covering the bone were lacerated, and the displacement was sufficient to allow the placing of a finger between the teeth. The apparatus used for securing the fracture was a vulcanized India-rubber plate as a splint, covering the teeth entirely, and secured by a fine screw on each side passing into a molar tooth. In this case, after securing the fractured extremities by passing a ligature tightly around the teeth at the seat of fracture to keep them in place, an impression of all the teeth of the lower jaw was taken in wax. From this a plaster mould was made, and on this the vulcanized rubber was cast. In this way was formed a splint covering and fitting accurately to all the irregularities of the teeth of the fractured jaw. A small hole was made through the outer side of the splint to allow the passing of a fine screw through it to be fastened into the first molar tooth on each side, to keep the splint from working up. It fitted so closely there was no necessity for it, as it has been worn since the first application without the screw. The instrument was made and applied some eight hours after the injury was received. As soon as it was adjusted, the fractured extremities seemed to be so securely held in place that I did not consider a bandage necessary. On the following morning the patient was in his office attending to his business, and continued to do so regularly. The splint remained on without being removed for twenty-four days. It was then taken off to see the condition of things, and a very good union was found to have taken place, sufficient to allow the patient to talk with ease to himself. The splint was then replaced without putting in the screws, and was worn regularly till the expiration of six weeks from date of injury. After that it was only worn while eating, or during the performance of his dental operations, when the muscular force used brought some strain upon the jaw. The splint fits so closely that food cannot work up between it and the teeth, and by using a syringe the parts were kept perfectly clean and pure.

"The advantages derived from the instrument are the perfect steadiness with which the fracture is held in place, the great comfort to the patient in being able to eat and talk, and if the fracture is in the anterior part of the jaw, being able to go without the application of a bandage, trusting entirely to the support of the splint. This would not be the case if the fracture was behind the first molar teeth, as there would not be sufficient support from one or two teeth to hold the fracture in place. In that case the ordinary bandages would be required, and the splint would merely assist in steadying the fracture and giving an even bearing for the upper jaw to rest on.

"After a careful consideration, I am led to believe that this splint can be made of great assistance in all cases of fracture of the lower jaw, where it is such as to require the use of bandages, overcoming irregularities in the jaw from the loss of teeth or irregular conformation, as the rubber can be moulded in any shape required, giving an even bearing to be bound up against the upper jaw, with indentations in the upper surface of the splint for the teeth of the upper jaw to rest in, holding the fracture in that way perfectly steady.

"An opening can be left in the front to allow the introduction of liquid food, and the instrument need not be removed till the cure is complete.

"Dr. Stevens.—I look upon the contrivance as far beyond anything in our way of treating fractures of the lower jaw that has ever been discovered. Like every other useful discovery, it has the advantage of great simplicity. As Dr. Sands has well remarked, it is not strictly applicable to fractures of the inferior maxilla, posterior to the canine teeth, but it may be made a great adjuvant even in the treatment of such cases. I congratulate the Academy on behalf of this discovery; for I firmly believe it to be of such importance as to last forever.

"Dr. Post remarked that Lonsdale had already advised a somewhat similar apparatus for the treatment of that variety of fracture. The plan was first to take a wax cast of the teeth, and then carve from that cast an ivory one, to adapt itself exactly to the teeth of the lower jaw. But, besides this, there was a wooden splint adapted to the base of the jaw, and the two screwed together. This apparatus was advised by Lonsdale in all cases of fracture of the lower jaw, but particularly those in which the upper teeth being defective, there was not sufficient support afforded by the upper jaw. The principle of Dr. Sands' splint was the same as that of Lonsdale, though the material and mode of construction were peculiar.

"Dr. Stevens.—The statement of Dr. Post is the only attempt of anything of the kind that has been made, so far as my reading or knowledge extends; but it was not of a character to diminish materially the value of this discovery. It has never been adapted to practice, and is almost entirely forgotten.

"Dr. A. L. Sands stated that his idea of Mr. Lonsdale's splint had been simply a carved piece of ivory adapted to the teeth of the lower jaw. In any event, he did not think it would compare to the adaptability of Mr. Gunning's apparatus.

"Dr. Anderson.—Mr. Gunning says that the cast had better be taken as soon as possible after the accident, in order to provide against the consequences of the gums swelling.

"Mr. T. B. Gunning.—The difficulty to be surmounted in promptly taking a cast of the jaw is not so much due to the swelling of the gums *per se*, as to the difficulty (in consequence of the swelling) of opening the mouth wide enough.

"Dr. Peaslee.—I would like to ask in what form the article can be purchased, in order that we may use it?

"Mr. T. B. Gunning.—It is very easily obtained, but not so easily worked. The most experienced surgeon would probably find it more to his advantage to call in a dentist to his aid; for there are a great many details about getting an accurate cast of the jaw, which one not acquainted with mechanical dentistry would not be prepared for. The surgeon should find the brains, while the dentist attends to the mechanical part. The

material is Goodyear's patent hard rubber, and may be obtained from any of the manufacturing dentists; but particularly of Franklin, who is the agent for it."—(*Ibid.*)

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"*Recovery of Gold from Cyanide Solutions.* By R. Huber.—The author gives the following as a quick and cheap process for reducing gold from inactive gilding solutions:—

"The liquid is first supersaturated with hydrochloric acid, and heated to boiling, on which a yellowish-green precipitate separates with the development of cyanic and carbonic acids. Some of the cyanide of gold remains in solution, the greater part of which, however, will separate on cooling. After separation from the deposit by filtration, the solution is heated again, some zinc, and, if necessary, more hydrochloric acid being added. In an hour or two the whole of the gold will be found reduced. The liquor is now poured off, and the precipitate boiled once more with hydrochloric acid. It is then washed and added to the other precipitates. The mixed precipitates, after drying, are ignited in a platinum crucible and then fused with an equal weight of acid sulphate of potash. When cold, the fused mass is boiled with strong sulphuric acid, the liquor is poured away, and the now perfectly pure gold is well washed with hot water. A cast-iron crucible may be used for the fusion instead of a platinum, but in that case the gold must be boiled with strong hydrochloric acid to remove the iron."—(*Dingler's Polytech. Journal* and *Chem. News.*)

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Bases of Artificial Teeth.—The *Chemical News* says that M. and A. Gabriel, of London, have applied for a patent, in England, for a "compound of India-rubber, seven parts, and sulphur, phosphate of lime, and phosphate of soda, of each two parts, to form a substance which can be moulded and afterward hardened (by heat) so as to give a very fair imitation of bone, and equally resist the action of acids. The surfaces are then fitted and polished, and certain parts, the base especially, coated with pure gold by the electrotype process."

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"*New Alloy.*—A patent for a new metallic alloy has been taken out in England by A. L. Woolf, of Birmingham. It is composed of 90 parts of copper, 5 of aluminum, and 2 of gold; all by weight. It is stated that, in making this alloy, the metals are simply placed in a crucible, and when fused, they immediately combine and form the composition, which is malleable, ductile, and can scarcely be distinguished from gold by its color."—(*Scientific American.*)

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Elasticity of Vulcanized India-Rubber.—It is stated (*Ibid.*) that, in the Supplement to Ure's Dictionary of Arts, etc., by Robt. Hunt, F.R.S., "the permanently elastic character of vulcanized India-rubber is thus set forth: 'Mr. Brockedon subjected a piece of vulcanized India-rubber, 1½ inches thick, and of 2 inches area, to one of Nasmyth's steam-hammers of 5 tons. It dropped upon it with a fall of 2 feet without injury; then the hammer fell upon it from a height of 4 feet, when the cake was torn, but its elesticity was unimpaired.' Vulcanized India-rubber withstands heat up to 300° F."

Hard Tack.—A correspondent of the *Vermont Phœnix* thus humorously relates (*Ibid.*) his experience with this substance: "The hard tack of the army I have found not only abundant, but sweet and good; it is, however, *hard tack*, being probably the worst substance to chew used as human food. Sea biscuit and navy bread are pulpy in comparison. Few men have been long in service without breaking out more or less front teeth and grinders in cracking the rations, which cannot be crumbled or softened. Meals, too, are often taken in a great hurry, or while marching, and the hard tack cannot be dipped in coffee or fried in fat to become smoother, though perhaps not more digestible; so that, in general, these stony, almost metallic lumps pass into the soldier's stomach every day, and go down undigested, causing dyspepsia and inflammatory diseases of the bowels.

"Hard tack is good, with this qualification: it can't be chewed; and is fit only for that generation mentioned by Solomon, whose 'teeth are as swords, and their jaw teeth are as knives.' So it is with good reason that our judicious Board of Enrollment exempt drafted men for loss of teeth. A cartridge can be torn with the thumb nail, but no gums can manage our army bread as now furnished.

"If it were softer, it would spoil in the hot, damp climate of the South; and the only thing is to have young men whose 'grinders have not ceased because they are few.'"

Care of the Eyes in the Use of the Microscope.—The *Westminster Review* gives the following instructive remarks upon this subject from the valuable work on "The Microscope and its Revelations," by Dr. Carpenter. "'Although most microscopists acquire a habit of employing only *one* eye, (generally the right,) yet it will be decidedly advantageous to the beginner that he should learn to use either eye indifferently; since by employing and resting each alternately, he may work much longer, without incurring unpleasant or injurious fatigue, than when he always employs the same. Whether or not he do this, he will find it of great importance to acquire the habit of *keeping open the unemployed eye*. This, to such as are unaccustomed to it, seems at first very embarrassing, on account of the interference with the microscopic image which is occasioned by the picture of surrounding objects formed upon the retina of the second eye; but the habit of restricting the attention to that impression only which is received through the microscopic eye may generally be soon acquired; and when it has once been formed, all difficulty ceases. Those who find it unusually difficult to acquire this habit, may do well to learn it in the first instance with the assistance of the shade just described, the employment of which will permit the second eye to be kept open without any confusion. The advantage of the practice, in diminishing the fatigue of long-continued observation, is such that no pains are ill bestowed by the microscopist which are devoted to early habituation to it. There can be no doubt that the habitual use of the microscope for many hours together, especially by lamplight, and with high magnifying powers, has a great tendency to injure the sight. Every microscopist who thus occupies himself, therefore, will do well, as he values his eyes, not merely to adopt the various precautionary measures already specified, but rigorously to observe the simple rule of *not continuing to observe any longer than he can do so without fatigue.*'"

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ORIGINAL COMMUNICATIONS.

PRACTICAL HINTS.

BY J. D. WHITE.

Diagnosis of Toothache.—From what we see every day, this subject is less understood by the profession in general than many matters of far less importance; we cannot expect the most difficult branches of our art to be as well understood by the young as by the more experienced members of our profession; but when many of both young and old are very sadly at fault, it is time that more attention was given to this apparently simple, but in truth most difficult, branch of our art. We have no doubt that too much attention is bestowed upon the *mechanical* part of dentistry, making *pretty plugs*, rather than whether the organ to be plugged is in a proper condition or not to receive a plug. It is very surprising that we see so many patients with beautiful work in their mouths, and yet uncomfortable or in actual suffering. The work has been done on the teeth as if the patient's head was but the head of a cane, to be put in a show case.

The road to a proper understanding of toothache is so long and tedious, that few ever persevere to the end. In the first place, a thorough knowledge of general and special anatomy is necessary. Organs differ in structure: hence the difference between *all* of the human body must be well understood to comprehend the *special* of any one or any set of organs. Anatomy at the present time is considered to be "the science of organization," the machinery by which the function of a part is carried on, or through which vital force acts. Physiology is "the science of life," the principles upon which life is carried on. The physiology of organs differs according to their kind or the part they perform in the economy. Pathology is intended to express the condition of a part as it changes from a healthy to an unhealthy state; by some it is the *physiology of disease.*

Diagnosis is the pathognomonic signs of each disease, and is the most important matter to which a student can apply his energies. How can a dentist know why any patient has pain, if he be ignorant of the minutia in the anatomy of the parts affected? or how can he know where the disease is located, if he does not know all about the peculiarities of pain in abnormal tissue? He must know what toothache is and what it is not. He must know what an organ is capable of doing; a part that is healthy is not a cause of pain; a part that is unhealthy can be a cause of pain. Yet it is not always true that morbid parts do give pain; it requires a certain excited condition of morbid parts to be a cause of pain. Hence we do not always have active toothache even when the parts are in a morbid or pathological condition. He must know what diathesis means, and causes one patient to experience a different kind of pain under similar circumstances; or, in other words, pathological conditions. We do not pretend to consider toothache in its various forms under separate heads, but give cases to illustrate, after the foregoing remarks of general import.

Neuralgia and toothache are confounded every day by dentists, patients, and physicians, and dentists will often find it difficult to settle the question between the two latter—especially now-a-days, when many otherwise intelligent patients consider their own opinions quite as good as their doctor's or dentist's, when pain is concerned.

Case 1.—A lady, about twenty years of age, presented herself for consultation last winter. She had been suffering for several months on the left side of the face, extending over the temple, along the lower jaw, and in the teeth of that side, sometimes in one and sometimes in another. She was associated with medical men, complained to them, but they seemed to regard her suffering as neuralgia. She consulted several dentists, one of them many times; he at last extracted the second bicuspid, lower jaw. The pain finally became very severe, especially at nights. We examined the case; as a general thing, she had good teeth; we found them all sound on the left side, but one—the second inferior molar. The suture in the crown, anterior portion, was slightly open; we cut it larger with our cutting instruments, and found the inner portion of the body of the tooth much decayed; the wisdom tooth was not yet erupted. As this tooth was not brought in direct contact with the food in chewing, the patient had not experienced pain from that cause. The intermitting character of the pain led the patient as much as the dentists to believe it to be neuralgia. But it is true that when a pulp of a tooth becomes irritated by decay approaching it, the pain experienced is of a paroxysmal character; it is also a fact that a pulp will remain in this state for months, until at last effusion, suppuration, and finally sloughing sets in, and the mischief becomes extensive, frequently terminating in alveolar abscess. The pulp was destroyed in this case and removed. When the bleeding subsided, the tooth was plugged, and has given no pain up to this time.

We must not consider pain in the face, temple, or any part of the head, neck, or down the shoulders even, as neuralgia, until we have by positive evidence proved that the pulps of the teeth are sound.

(To be continued.)

TAKING IMPRESSIONS IN PLASTER OF PARIS.

BY ABR. ROBERTSON, D.D.S., M.D.

This has become quite a hackneyed subject, much having been written upon it, especially within the last two or three years. But, as a good impression is so very important a matter in constructing a serviceable set of artificial teeth, and on any kind of base, and as my method varies somewhat from those I have seen described, I propose to offer a few remarks on the subject.

I have used plaster of Paris for taking impressions for many years—almost ever since Dr. Dwinelle first introduced it to the profession for that purpose; and for full sets, I use no other material, and know of no other at all to be compared with it.

It is true that the operation can be more quickly performed with "good yellow beeswax" than with plaster of Paris; and this in irritable cases, where emesis or retching is produced by manipulations on the palate, is an advantage, and the only one to me known that the wax has over the plaster; and even this advantage is often more theoretical than practical, for sometimes, at least, the gliding of the wax over the palate, as it is forced from the cup in pressing it to its place, produces this result, when it would not be produced by the softer and less tenacious plaster.

On the other hand, it has several disadvantages. First, in mouths with thick and soft integuments, especially if some parts of the mouth are softer than others, as perfect an impression cannot be taken, the force required to adapt the wax to all parts of the mouth necessarily displacing these softer parts. Second, when the wax is so perfectly applied as to exclude all the air, making a perfect atmospheric fit, it is almost impossible to remove so plastic a material without displacing some of it while detaching it from the gums; more generally, in these cases, the part resting on the palate is liable to be bent. But, if it has been successfully detached from the gums, there is still another difficulty likely to occur. If the wax projects above the rim of the impression cup, this part is liable to be bent inward by the action of the lips in withdrawing the impression from the mouth, sometimes unavoidably so.

The plaster of Paris has none of these objections, for, though so soft when first applied as to take an exact impression of the finest lines, and without sufficient force to displace the softest parts when ready to be removed—when "set"—it cannot be bent nor misshaped by any force short

of that required to break it, and even then the broken parts may generally be readily readjusted.

Among those who use plaster, and have described their methods, I have been surprised to find that most, if not all, recommend mixing it as thin as it can be handled, and then using as little as will answer, and in a cup as small as will conveniently inclose the parts from which the impression is to be taken. Some recommend first taking an impression in wax, as near as may be, from which models are to be made, and a plate struck, into which a small quantity of a very thin batter of plaster is poured, and placed in the mouth.

Some pour a similar batter of plaster into the wax impressions and replace that in the mouth.

Both these methods, according to my observation and experience, are entirely futile. So thin a coating of plaster has not strength enough to amount to anything: not half enough to sustain its removal from the mouth, and it is almost as likely—more so, if left in a little too long—to adhere to the mucous membrane of the mouth as to the wax or the plate into which it was poured. Always, or most generally, at least, more or less of it will be found adhering to the mouth in little patches, often leaving the impression less perfect, and much more rough than the original wax one.

My method is entirely the opposite of those described. In the first place, I select as large and deep a cup as the mouth can well accommodate, thus securing considerable space between the rim of the cup and the outer margin of the gum, into which a sufficient body of plaster may be forced up and lie to give it strength. I also mix my batter as thick as is consistent with its ready adaptation to the parts, or so that it will pile a little.

The water should first be put into the vessel, and then the plaster either sifted or slowly poured into it, and then beaten sufficiently to free it from air bubbles; then transferred to the cup, and quickly and evenly applied to the mouth, with very gentle pressure, and there steadily sustained till it has set, the lips meanwhile having been brought fully over the edge of the cup, and gentle pressure applied to insure the perfect adaptation of the batter to the gums. This should remain in the mouth, great care being taken that it is not moved in the least, after it has been properly placed there, till the plaster has fairly set—no longer. If allowed to remain too long, it is more difficult to remove, and there is also some danger then of removing some of the mucous membrane of the mouth along with it; care is therefore necessary in removing the impression, or injury may be inflicted. The reason for this is, that unless there is all the water added to the plaster that can be consolidated in the process of "settling"—in which case it will set both slowly and feebly—the mucus of the mouth is taken up by the plaster, leaving the membrane dry and ad-

hering to it; hence the necessity of care not to allow the plaster to remain too long in the mouth, and of caution in removing it gently.

I have frequently known beginners to suppose they had a very fine impression—a perfect "atmospheric fit"—because the plaster adhered very closely to the mouth, when in fact they had no impression at all!

My method of removing an impression from the mouth is, first to seize the handle of the cup with my right hand, and with my left raise a portion of the lip till I bring the reflected mucous membrane on a stretch. This allows the air to insinuate itself between the gum and the impression, and greatly facilitates the operation.

The plaster is to be mixed in the same manner and of the same consistence, and the same principles observed in taking an impression of the lower as of the upper jaw.

WHEELING, VA.

IRREGULARITY OF THE TEETH.

BY H. MEREDITH WHITE, M.D., A.M.

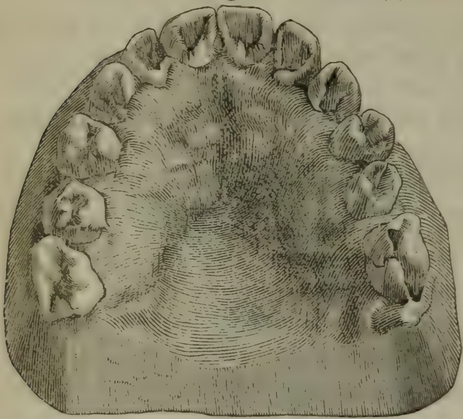
MISS M., aged fifteen years, came to the office January 2d, 1862. Figure 1 represents the condition of the upper jaw, with the exception of the two deciduous molars, which were removed that day. It will be seen that the eye teeth and first bicuspids are too far front, and that the incisors are behind their proper arch. It was deemed expedient to draw back the eye teeth and first bicuspids to their places before attempting to bring forward the incisors, it being thought imprudent to encumber or distress the mouth much.

Fig. 1.

A plate was accordingly made for the jaw, fitting firmly against the front teeth. In front of and attached to bands that pass around the first molar teeth were small rings, one for each band. Attached to each ring was a piece of India-rubber tubing, which was drawn forward and slipped over the bicuspid of each side. In a few days they were drawn to their proper places; then a section of tubing was tied to each ring, and then ligated to the eye teeth, which were more difficult to move, it requiring between two and three weeks. By actual measurement in the mouth, the bicuspids were drawn

back one-eighth of an inch, and the eye teeth three-eighths of an inch. These teeth were then held in their places by means of ligatures, it being found that there was a great tendency to recover their former positions.

Fig. 2.



A bar was then added to the plate, and passed in front of the incisors, which were ligated to it; and in three weeks were in their proper places.

A plate with pieces for the back part of the incisors was then made, and a thin and delicate hickory bow made to extend to the second bicuspid of each side, which had now come through. To the bow all the moved teeth were tied, by means of which the teeth were settled and became firm in a regular arch. The patient continued to wear the plate to hold the teeth for some time after the completion of the case. October 10th, 1862, the patient ceased wearing it. The plate was kept by the patient, who was instructed to place it in the mouth every few weeks; and if any change in the position of the teeth took place, to resume its use. As yet no change has taken place. Figure 2 represents the case when finished.

PHILADELPHIA, September 5th, 1863.

MATTER AND FORCE.

BY HENRY MORTON, A. M.,

PROFESSOR OF CHEMISTRY IN THE PHILADELPHIA DENTAL COLLEGE.

SOME text-books very low in the scale of science, in fact at the very foot of the ladder of learning, contain a definition of "matter" as "that which may be seen, felt, tasted, smelled, or handled;" and a subsequent division of such matter into "ponderable and imponderable;" including in the first class all that the world at large deems material; and in the second such "*forces*" (to give them their true title) as Light, Heat, etc.

Such slipshod definition as this may seem hardly worthy of our criticism; but similar ideas, more or less felicitously expressed, are to be found in better company, and the error in which they originate has a

wide range, and bears even upon the most advanced scientific developments; so that we may perhaps be pardoned, if in these pages we attempt the discussion of a subject which, at the outset, appears of a too elementary character. To the dentist, moreover, dealing as he does so largely with the practical relations of matter and force, this discussion may be of decided value; especially at the present time, when so many general scientific principles are receiving practical and material embodiment in the field of invention.

The famous Dr. Young tells us that a definition of "matter," unexceptionable and in few words, is not to be obtained; but we are disposed to think that the great mathematician yielded in this case to his well-known proclivity of overestimating difficulties, and that a slight modification of the definition in common use among able writers on these subjects would satisfy even his fastidious requirements. If we define "matter" as "that of which two portions cannot exist at the same time in the same place," we have a boundary line at once sufficiently *inclusive* and sufficiently *exclusive* for our purpose. It clearly includes as *matter* all solids, liquids, and gases; for with all such bodies, *one* must displace the *other*, to occupy its position; and as clearly it excludes from this class all such immaterial agents as light and heat, which may be added, ray to ray, until myriads are concentrated into the smallest space, without the least mutual displacement.

Our definition in fact gives us a well-known, compact, and definite class of objects as *matter;* neither more nor less than the sixty odd chemical elements, alone or combined; and leaves us to arrange, under their appropriate head of force, those fugitive entities which we cannot, without violence to natural perception, associate with the substantial ideas implied by the word matter. It is true that in our theories of light, heat, etc., we speak of certain "fluids" and "ethers," as if they had some sort of material existence; but it must be remembered that these "fluids" exist as yet for us only in idea, in theory, and may any day be blown out of being by the breath of some better hypothesis. While even if they were *proved* to exist, and to be material, the forces which they transmit (being motions, vibrations, etc.) would in nowise share their materiality. Sound is a vibration of the air; air is material; but no one calls sound *matter;* so light, being a vibration of the hypothetical "ether," would be in no respect *matter*, even if this ether should prove to be a material substance. Should this proof come, we can then add this new element to our list—as we have lately added those discovered by Bunsen; but even then the forces of light, heat, electricity, etc. will remain forces still.

We have, then, as the basis of our physical studies, a limited but thoroughly defined region of "matter;" a country of known boundaries and certain topography.

Giving life to this region, as soul to this body, we have the active element of *force.*

Force we know only by its effect, and we therefore say, it is "that which produces motion or change."

Applying this definition to nature, we see at once a multitude of individual forces to be included in this class. Gravitation, the *moving* Atlas of the universe; Electricity, the *true* Vulcan of Jove's thunderbolts; Galvanism, the wing-footed messenger of mortals; Chemical affinity, the all-powerful magician; Life, the *realized* Promethean fire, and many more, come into the ranks of these *movers* and *changers.* Among them is great diversity in character and action; yet in two important points unity pervades all.

In the first place, the daily developments of science seem to point toward the close relation of *motion* with *force.* Dynamical theories of light, of heat, of magnetism, daily gain ground, and the time may come when motion among particles of matter may be synonymous with force.

In the second place, the doctrine of transmutation of forces, supported as it is by the investigations of "equivalents of force," is working, even more directly, toward the same establishment of unity. Many cases of this transmutation are well known to all: thus in the telegraph, galvanic is converted into magnetic force; in the magneto-electric apparatus, the action is reversed—and here magnetic becomes galvanic force; either of these forces again may be made to develop heat, and heat, by means of thermo-electric battery, to develop galvanism; and so on through the whole range of forces, including even life, the same conversion is possible; this too being a true substitution, or rather metamorphosis—that is, the *producing* force disappears exactly in proportion as the *produced* is developed.

Holding this theory, we believe that any force may be converted into any other when brought under the requisite conditions, and that thus force never perishes; but when it seems to die it only changes its character. Thus, when the sunlight falls on the trees and grass, part is reflected, but that which is absorbed and seems to perish, is, in fact, converted into affinity, holding together the gaseous elements of the organic body; and when these are again liberated, if the process be rapid, the light will again appear as flame; or, if the change be slow, as in decay, it will be eliminated in the form of heat. Force, according to this theory, shares with matter its immortality. It may escape our hands, change its form, vanish from our eyes; but it cannot die, even though it be entombed for ages uncounted in the bowels of the earth.

We sit by our winter fireside, with the glowing coal for our domestic sun, and though we may not know it, we are, indeed, basking in the light of pre-Adamic days. Those very rays which now fall upon us, once, in ages incalculably distant, pierced through the thick foliage of gigantic

fern forests, and showed to the greedy eyes of mastodon and saurian the bright patches of reedy grass amid the roots.

The sunbeams were caught in the fibres of the growing forest, and there, as by some sorcerer of Eastern fable, metamorphosed and made warders of the combined elements; then they groaned for long centuries, crushed in the dark dungeon of the coal mine, until at last brought to light by their human discoverers, and, freed from their task of guarding those elements which again return to earth and air, the imprisoned forces burst forth, like the fabulous rescued genii, sometimes to serve and bless, sometimes to destroy their deliverers.

The many and various forces then resolve themselves into one Protean power—one force in many forms; which, could we trace it up to its origin, would be perhaps only the eternal, self-consistent volition of the Deity. Looking thus upon the universe, we see the various forms of matter acted upon by ever-changing, yet eternal force; ever-varying, yet the same; daily dying, yet hourly reborn—or rather, we see the Divine Weaver, weaving cosmos with the many-colored warp of *matter*, and the ever-changing woof of *force*.

DROPSY OF THE DENTAL SAC.

BY H. MEREDITH WHITE, M.D., A.M.

PROBABLY the above may be an appropriate name for a pathological condition of the dental sac that has recently come under the notice of the writer. The patient was a boy aged twelve years. The gum over the second molar, right side, lower jaw, was swollen about the size of a half hickory nut, purple color, painful, and tense to the touch, fluctuating, and somewhat translucent. The swelling was lanced, when there escaped a small quantity of lymph mixed with pus, and tinged with blood. Marked relief ensued on the escape of the fluid.

During the early part of last summer, a little girl between eight and nine years of age presented, suffering from a diseased condition of the gums of the left side, above and below. In the lower jaw were several fragments of teeth that were rough and irritating to the gum. In the upper jaw the gum was exceedingly inflamed, and discharging pus from the ruptured sac of the first bicuspid tooth. Within the sac was lying the blackened and loose cap of the tooth, which eventually dropped from its position and was lost.

In the latter case the effusion had been so great, that the sac was dissected away from the growing tooth, and its death ensued.

An effusion sometimes takes place in the areolar tissue without the sac, but is distinguished from the other because of the diffused and less defined character of the swelling. The cause of both may be a bruise, the result

of chewing upon the sac containing the tooth, or in the use of ivory rings, or other substances given to children to bite on; or it may arise spontaneously. There are many serious results likely to attend this affection when occurring in children, which will readily suggest themselves. In adults, also, the loss of the tooth, or perhaps more dangerous sequelæ, may occur.

Lancing the whole length across the crown of the tooth, in the direction of the curve of the arch, will give relief. The bleeding attending the operation benefiting greatly, care must be taken to make the incision sufficiently large. If there is a tendency on the part of the lips of the wound to unite, a tent of cotton must be introduced to drain off the fluids. If the inflammation be great, it may be necessary to use remedies to allay it; if, on the other hand, the action of the parts is sluggish, it will be required to resort to a stimulating treatment.

PHILADELPHIA, June, 1863.

GLEANINGS FROM THE PROCEEDINGS OF THE DENTAL SOCIETIES OF NEW YORK AND BROOKLYN.

BY J. S. LATIMER, D.D.S.

DR. ATKINSON said he had yet to see the first case of recurrence of alveolar abscess after the disease had been once subdued by treatment. When no soreness is felt on pressing the gum and tooth, he deems the cure complete.

Dr. Fitch said the death of the pulp is the result of congestion and strangulation. He uses an infinitesimal portion of arsenious acid and leaves it in the cavity from one to three weeks, at the end of which time he generally found the pulp tough and leathery; giving comparatively little trouble in its removal. Dr. Fitch treated alveolar abscess successfully in 1854. He could not agree with Dr. Atkinson that abscess is caused by the retention of dead molecules in the pulp; that might be the exciting but hardly the primary cause.

Dr. Atkinson had yet to see a pulp yield to many applications of arsenic which had refused to succumb to one; we had to extirpate, and might as well resort to it at once.

Dr. Wm. H. Allen leaves the arsenic in contact with the pulp about eight days.

Dr. A. C. Hawes finds that the pulp is generally easily and painlessly removed at the end of a week; during which time the arsenic is permitted to remain.

The employment of the mallet in filling teeth being under discussion, all spoke favorably of its use, and only two had not used it. The only

objection raised was the necessity of having an assistant to do the malleting.

Dr. Kingsley, at a meeting of the New York Association, said he had used oxy-chloride of zinc over healthy exposed pulps, and had found the pulps alive and healthy many months afterward. He had not noticed any secondary deposit of dentine in such cases.

Dr. Wm. H. Allen, a few weeks since, exposed a pulp while excavating. He wiped the cavity with creosote, then dried and filled with Hill's stopping. At the end of three weeks the temporary filling was removed, the pulp found well protected with dentine, and the cavity was filled with gold.

Several gentlemen reported favorably on the method of rapid wedging in the separation of teeth, recently recommended by Dr. Atkinson.

It will be remembered that this method is simply the gradual forcing of a nicely-tapered wedge of orange or hickory wood between the necks of the teeth to be separated. This is said to accomplish the object in a few minutes, and to cause much less pain and inconvenience than the slow method usually practiced.

THE PROFESSION IN ENGLAND.

(FROM OUR LONDON CORRESPONDENT.)

A LONG period has elapsed since my last communication, not because I have had nothing to write about, but because one circumstance or another has from time to time occurred to prevent my writing. In truth, great events have taken place in our profession. When you last heard from me, we were divided almost against hope of union. Now this is most happily changed. It is true the College of Dentists of England, which was established by dint of labor of the most arduous kind, is defunct. The independent principle advocated by its supporters and workers met with plenty of sympathizers; but in the persons of too many, the sympathy did not extend to individual effort in its behalf by any sacrifice of time or money. "Go on," said these men, "and when you get a charter we will join you." If, instead of such conduct, a large body of the profession had taken to the membership, the charter would have followed; as it was, the thing became impossible. Thus the executive and members found themselves in the position of being strong enough to impede the opposing section in the profession, without possessing sufficient influence to accomplish their mission with anything like satisfaction to themselves or benefit to the general body. Negotiations were then commenced with the Odontological Society, the latter entering most cordially into the proposal of a union between the two institutions. Each side appointed three representatives to arrange the terms of amalgamation. On the

part of the Odontological Society, Messrs. Arnold Rogers, Tomes, and A. Canton; on the part of the College, Messrs. Hulme, Rymer, and Weiss.

After due consideration and deliberation, these gentlemen accomplished their somewhat difficult and delicate task; and the evening of Monday, May 4th, witnessed the reception of the members of the College of Dentists by the members of the Odontological Society, the fusion between the two being accomplished by the announcement of the President (Dr. Samuel Cartwright, Jr.) of the terms of union under the title of the Odontological Society of *Great Britain*, (instead "of London.") The President and Mr. Arnold Rogers made some observations upon the subject of union of a graceful nature, and offered a warm greeting on the part of the members of the O. S. to the late M. C. D. E.'s., Mr. Rymer acknowledging the compliment on the part of the latter.

This arrangement of course leaves to the Royal College of Surgeons all power in regulating the education of candidates for admission into our ranks as qualified men.

The two dental hospitals go on as before, and so do the schools, except that those brought into existence by the College of Dentists must obtain the recognition of the College of Surgeons or die. I hope and believe the former will be accomplished, and that all these institutions will live long and usefully.

The shut up of the College of Dentists was marked by an act of gratitude on the part of the members toward a couple of gentlemen who had for a number of stormy years worked the wheel under the direction of the several captains: Robinson, (poor fellow,) Peter Matthews, (not the great,) Wade, (the weak,) and Imrie, (the genuine old Englishman.) The act consisted in an invitation to the used-up honorary secretaries—Rymer and Hockley—to a feed at the St. James's Hall, and the presentation of pieces of valuable plate to each, with the following inscriptions respectively:—

"Presented to Samuel Lee Rymer, Esq., May 11th, 1863, by members of the College of Dentists of England, as a token of respect, and in acknowledgment of his services to the Dental Profession. College of Dentists of England, founded by Samuel Lee Rymer, Esq., December 16th, 1856. United to the Odontological Society of Great Britain, May 4th, 1863."

"Presented to Anthony Hockley, Esq., May 11th, 1863, by members of the College of Dentists of England, as a mark of respect, and in acknowledgment of his services as Honorary Secretary. College of Dentists of England, founded December 16th, 1856. United to the O. S. of G. B., May 4th, 1863."

I need not say that much kindly feeling was evinced on this occasion.

As to the future of our profession, I look forward hopefully. The evils of disunion have been so manifest that none of any influence would

look otherwise than fearfully should any appearance of their recurrence unhappily ever show itself, so that the seed would be destroyed ere it could germinate.

We want a suitable building for professional purposes in London, in which the meetings of the Odontological Society might be held, and a museum on an extensive scale deposited. The rooms at present occupied by the Society are neither convenient nor ornamental.

Some discussion takes place now and then as to what title the persons should use who have the dental certificate of the R. C. S. It is generally given as "Licentiate in Dental Surgery." There is, however, no right to such a title, as it implies the possession of a *license* to practice dental surgery, which is simply absurd in the now state of the law. It would be well that it were otherwise, and I suppose an effort will be made toward legalizing the title.

Just now all is at a stand-still, it being vacation time. No meetings or sensations can be expected before November. I shall hope to keep you posted occasionally as matter of interest turns up.

London, August, 1863.

PROCEEDINGS OF DENTAL SOCIETIES.

PROCEEDINGS OF THE ODONTOGRAPHIC SOCIETY OF PENNSYLVANIA.

REPORTED FOR THE DENTAL COSMOS BY G. W. ELLIS, M.D.

A monthly meeting of the Odontographic Society was held on Tuesday evening, September 1st, at the rooms of the Philadelphia Dental College.

Called to order at half-past eight o'clock.

Vice-President, Dr. Kingsbury, in the Chair.

The minutes of the last meeting were read and approved.

The Executive Committee reported the following gentlemen as candidates for membership, and each upon separate ballot was elected:—

Active Member.—Dr. Chas. Sill, Pittsburg, Pa.

Corresponding Members.—Drs. C. W. Spalding, St. Louis, Mo.; Geo. Watt, Xenia, Ohio; W. B. Hurd, Brooklyn, N. Y.; C. R. Butler, Cleveland, Ohio; E. Saunders, London, England; W. A. Pease, Dayton, Ohio; W. W. Allport, Chicago; Joseph Richardson, Terre Haute, Ind.

Honorary Members.—Prof. Henry Morton, A.M., Philadelphia; Dr. B. Ward Richardson, London, England.

Several nominations were made, and the proposed names submitted for the consideration of the Executive Committee.

Donations to the library being in order, Dr. McQuillen said that, re-

garding it as a matter of the first importance for the Society to have a *good* library at the earliest period practicable, he had placed the bookcase, which the gentlemen saw in the adjoining room, there with the view of having it filled with books; trusting that the funds of the Society and the liberality of its members and their friends would soon enable them to effect the end desired. In addition to offering the case as a repository, he presented to the Society the following books: Dunglison's Human Physiology, 2 vols.; Miller's Principles of Surgery, 1 vol.

Dr. Kingsbury said that he wished to present the following works to the Society in the name of Mrs. Horace Wells, widow of the late Dr. Horace Wells, of Hartford, Conn.; upon a recent visit to that place he was intrusted with their delivery as a donation from that worthy and estimable lady, viz.: "An Examination of the Question of Anæsthesia, arising on the Memorial of Chas. Thos. Wells," by the Hon. Truman Smith, United States Senator from Connecticut; "An Essay on the Teeth," by Dr. Horace Wells.

Dr. Flagg moved that the thanks of the Society be tendered Mrs. Dr. Horace Wells and Dr. McQuillen, for their manifestations of interest in its welfare. Carried.

The following paper was then read:—

"THE BLOW PIPE."

BY WM. GORGES, D.D.S.,

DEMONSTRATOR OF MECHANICAL DENTISTRY IN THE PHILADELPHIA DENTAL COLLEGE.

The working of metals appears to have been coeval with Adam, and it is reasonable to infer that at a very early period of the earth's history the blow-pipe was used in that connection. Within the last fifty years, important and valuable modifications have been made in the instrument, through which, substances that are entirely unaffected by the action of ordinary heat can be reduced from a solid to a fluid condition with perfect facility. I refer, of course, to the great and inestimable discovery of the compound, or oxy-hydrogen blow-pipe, by the late Professor Robert Hare, of Philadelphia. For ordinary purposes, however, the more simple and primitive the pipe, the better. In this form it is not only a necessary, but an indispensable adjunct to the dental laboratory.

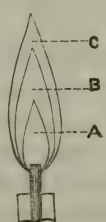
In entering upon the consideration of this subject, I propose, first, to consider briefly the phenomenon of *combustion*, as manifested in the flame of a lamp. *Secondly*, the various kinds of lamps and pipes which have been introduced for the use of the dentist. And lastly, the proper way to use the blow-pipe so as to secure the end desired; for much of the loss of time, patience, and confidence in one's ability to use the pipe, depends upon an imperfect knowledge or ignorance of the philosophy which underlies this, as it does all other operations in mechanics. Who has not experienced, even after a lengthened novitiate, the greatest vexation and fatigue,

approaching almost to complete exhaustion, in attempting to solder a set of teeth requiring more than an ordinary amount of heat to fuse the solder? The greatest pains may have been taken to make a complete fit of the plate to the cast of the mouth, the teeth may have been ground and adjusted, promising the patient as well as the operator something superior in every respect. Alas! how great the disappointment, after removing the investing substance, to find teeth cracked, or drawn from the plate, or the plate itself warped, so as to render the piece useless for the purpose intended!—such accidents being not only embarrassing, on account of the non-fulfillment of the promise to the patient, to have the operation completed at a given time, but also involving sometimes quite a pecuniary loss. In the early part of my practice I found such accidents of common occurrence with others as well as myself, and therefore recognized the importance of becoming thoroughly acquainted with the subject in all its bearings. If in my presentation of this matter you should regard some points touched upon as too elementary in their character, you must refer it to a desire on my part to awaken others to a necessity of becoming acquainted with the basal principles.

Fownes says that, "(in the most general sense,) a body in a state of *combustion* is one in the act of undergoing intense chemical action; any chemical action whatsoever, if its energy rises sufficiently high, may produce the phenomenon of combustion by HEATING THE BODY TO SUCH AN EXTENT THAT IT BECOMES LUMINOUS."

In the ordinary combustion of substances, it is an indispensable requisite that there shall be a due supply of oxygen brought in contact with the flame, or the action will cease. Combustion is therefore due, under these circumstances, to the union of an inflammable substance with oxygen, attended with light, and in most instances with heat. It is the latter consideration, or the elimination of heat, which is most interesting and important to us at the present moment.

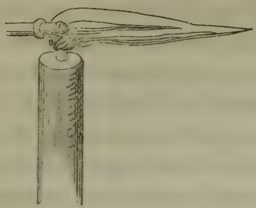
Fig. 1.



With this object in view, it may not be amiss to direct attention to the well-known fact that the flame of a candle or lamp burning in the air is hollow, and that when carefully examined it is found to be composed of three distinct portions, as represented in Fig. 1. Their characteristic properties are as follows. The outer cone or envelope C gives forth very little light, but possesses a very high *temperature;* the cone inside of this, B, is highly luminous; while the internal portion A is dark, and composed of combustible matter. When a current of air is driven by the blow-pipe against a flame, the nozzle of the instrument being in contact with the flame, "two long pointed

cones (Fig. 2) are observed in place of the double envelopes just described, the outer cone being yellowish, and the inner blue, a double combustion taking place by the blast *inside*, and by the external air." The space between the inner and outer cones is filled with exceedingly hot combustible matter, possessing great deoxidizing or melting powers. In the use of the blow-pipe it is a matter of importance to bear in remembrance the point where the highest elevation of temperature exists. It is not an unusual thing to see a tyro ignorant of these facts blowing a blast of cold air on his work, by placing the nozzle of the pipe too far in the flame; for, paradoxical as it may appear, the instrument can be made to blow hot or cold.

Fig. 2.



The mouth blow-pipe is the instrument in general use, but I have discarded it for the following reasons. In studying the physiology of respiration, I was led to question whether air which is exhaled from the lungs will support combustion, for the air blown from the mouth must have been inhaled into the lungs to perform its part in sustaining organic life. Chemistry teaches us that atmospheric air is a compound gaseous body, composed of twenty volumes of oxygen to eighty of nitrogen, and is indispensable to organic existence. In performing its part in the animal economy, it undergoes a change; the oxygen is *absorbed*, and carbonic acid gas is *expelled.*

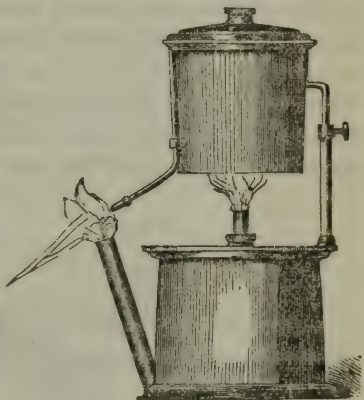
"There is a popular theory which declares respiration to be a process of *combustion* or *oxidation*, and it no doubt has caused many a reader a pleasant feeling of surprise when first informed that the burning of a candle, the rusting of iron, and the process of breathing were only three forms of the same process, three names for three different forms of combustion or oxidation. There is great satisfaction in such generalizations when they are true, and one regrets to find that sometimes they are not; this one is not. The burning of a candle and the rusting of iron are indeed two forms of one process of combustion: they are oxidations; but respiration can no longer be considered in any sense as a process of oxidation. Respiration as a process is twofold—the *exhalation of carbonic acid*, and the *absorption of oxygen.* The difference between the two processes may be summed up as follows: *combustion* is only *oxidation*, while respiration is not *oxidation*, but an *exchange* of gases. In the combustion of the candle, the oxidation is everything, and no process of exchange takes place. In the breathing of an animal, the exchange is everything, and no oxidation takes place. It is a well-known fact that if a lighted candle is lowered into a well containing carbonic acid gas, it is speedily extinguished."

The foregoing facts have induced me to regard the air exhaled from the lungs, loaded as it is with carbonic acid gas, as unable to support combustion, and therefore unfit to be used for the purpose of soldering. It may be said that the mouth-pipe has been used from time immemorial, and that the flowing of solder has been and can be readily effected by it. While admitting this to be the case, it does not militate against the correctness of my conclusions, that it is far better to use the blow-pipe with some apparatus by which atmospheric air may be employed in place of the air exhaled from the lungs.

Various ingenious contrivances have been invented as substitutes for the mouth-pipe. The majority of these are on the self-acting principle, in which the heated vapor of alcohol is driven by expansion from a reservoir or boiler through the pipe on a flame of the same substance.

A brief description of some varieties of these may not be amiss, as they have a direct bearing on the subject under consideration; and while they are familiar to many present, there may be some here and elsewhere who are not acquainted with them.

Fig. 3.



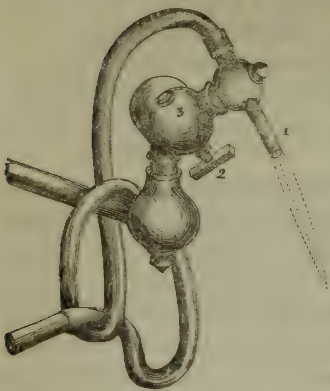
The first of these (Fig. 3) consists of a lamp made of tin, capable of holding half a pint of alcohol, having two wicks, over one of which a brass boiler, containing the same quantity of alcohol as the lamp, is suspended on an upright rod, the boiler being readily moved up or down the rod by means of a set screw; the second wick of the lamp is placed in such a position as to be in a direct line with the vapor of alcohol escaping from the boiler through the pipe. Two points can be attached to the pipe, so as to produce either a flaring or a pointed flame.

Another modification of this is formed by a boiler made of sheet-brass, supported on a sheet-iron frame, having a lamp underneath made of tin. This acts upon the same principle as the first described.

In each of these it will be seen that the lamp not only supplies a flame for the vaporization of the alcohol in the boiler, but also one in addition for the soldering. The next one to which attention is directed, however, known as Hollely's patent, is somewhat different. The boiler in this has a lamp underneath it for the vaporization of the alcohol, and another in front of the pipe to be employed in soldering. The pipe is so arranged as to allow the vapor of the alcohol to escape, by means of a faucet, through a large or small aperture at the end of the pipe, in this way producing either a pointed or flaring flame.

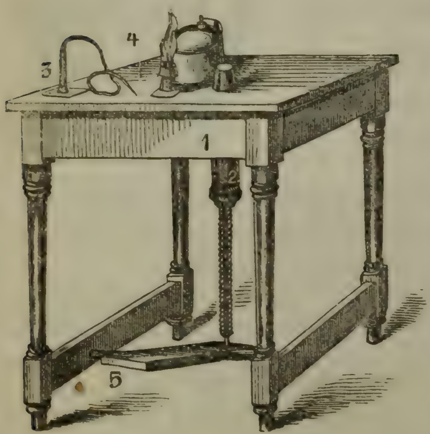
The Macomber gas blow-pipe (Fig. 4) is an ingenious contrivance, and is designed to be attached to a gas-pipe, employing gas in place of oil or alcohol. It may be described as follows: No. 1 is a double tube, or rather a tube inclosing a tube, the atmospheric air being driven through the centre tube, adding force and giving a cylindrical form to the flame. No. 2 is a stopcock, by which the size of the flame may be regulated. No. 3 is a movable joint, by which the flame can be directed upward or downward.

Fig. 4.



The best arrangement for soldering, to my mind, is one which I have in use, made by myself. It is not only simple and inexpensive in its construction, but eminently efficient. It consists of a plain deal table, having connected with it a small bellows of the blacksmith pattern, sixteen inches long and nine inches wide at its broadest part. The nozzle of the bellows is connected with a long metallic tube which passes through the top of the table, where any ordinary blow-pipe is attached to it in a stationary and perpendicular manner. The nozzle of the blow-pipe is bent down at an angle of forty-five degrees. With an apparatus of this kind, the pipe being stationary, the operator has his hands entirely at liberty, as the bellows is worked by the foot.

Fig. 5.



A very satisfactory apparatus (Fig. 5) is employed by many practitioners, consisting of a table with an air-chamber 1, into which the air is driven by a force-pump 2, the latter being worked by a treadle 5, and spiral spring. The pipe 3 conveying the air from the chamber is so arranged on the table as to be moved about in any direction to meet the lamp 4, which can be placed in such position as may be demanded by the work in hand.

As a preparatory step, when engaged upon a case requiring soldering, I invert the set of teeth over a flame of ordinary gas, so as to heat it up gradually until the plate and teeth are brought almost to a red heat;

then with the pipe I direct a broad flame on the work, steadily intensifying without reducing the volume of flame, until the soldering is completed, which can easily be done by adding weights to the top of the bellows. I never concentrate the flame to a focus on any one point of the work, or use what is called a pointed flame, believing that the alternate and sudden variations of temperature to which the operation is subject under such circumstances is the cause of the warping of plates and the cracking of teeth, so much complained of by many practitioners. These difficulties are increased by the difference in expansion and contraction between the plate, teeth, and investing material. This last-named cause of trouble in soldering is a direction in which I propose to make some experiments, and will in a future paper give the results of my observations in detail.

Dr. Flagg said that he had heard of the proposed subject with convictions that it would combine interest with practical utility to a very marked extent; but he was even more than confirmed in his opinion at viewing the extended field which had been opened by the paper just presented. For himself, he had never reduced the act of using the soldering-lamp and blow-pipe to anything which might be termed scientific in its application; but he fully appreciated that the paper took cognizance of truth, which he had learned experimentally to be of the utmost practical value.

There was one point, however, which he felt disposed to combat, if it were only for the sake of further eliciting argument to substantiate the correctness of the position assumed; and that was the unfitness of the air from the mouth blow-pipe for the purposes of combustion. He acknowledged that an improper, injurious, and almost impractical use of the blow-pipe would give rise to the objection; and he would admit that he had often seen those employing it inhale a full inspiration through the nose or mouth, or perhaps both, and exhale through the blow-pipe the air thus obtained. He regarded this as an *abuse* rather than a use of the valuable instrument under consideration.

A proper employment of the muscles pertaining to the throat and palate to drive the air into a chamber formed by the cheeks, and closed posteriorly by the tongue acting as a valve, and the use of the natural elasticity of the buccal tissues to compress such air with the degree of force required, constituted the secret of successful and easy use of the mouth blow-pipe. This need not, and *should not*, interfere in the slightest degree with the even, natural inhalation and exhalation through the proper channel of the nares.

He wished at this time to call the attention of the members to the peculiar form of soldering-lamp which he had in use in his laboratory, and which he thought combined many requisites pertaining to a portable lamp. The lamp consisted of an *oblong*, square body, at one end of which was soldered a small tube; this, projecting from quite near the bottom of the end, was attached to an upright tube of an inch in diameter,

which contained the wick. The objects gained were three in number: first, safety, from impossibility of explosion; second, diminished danger from upsetting when elevated on account of decrease of oil or alcohol; third, the advantage of gaining a *head* of fluid by slight elevation. The attainment of these requirements was demonstrated.

Dr. Wardle said he was not much in favor of the mouth-pipe, and never could avail himself, in a *scientific* manner, of the principle spoken of by Dr. Flagg.

Many years ago, he was making a piece of work for the late Dr. E. Townsend, which was both difficult and delicate to solder. A friend seeing the exhausted condition of the operator, insisted upon his inventing something better than the mouth blow-pipe. He made a pair of tube-bellows, and found them to work very well. Afterward made similar ones for a number of dental friends; among the number, he made a pair for Dr. S. S. White, from which he supposed the air-pump soldering apparatus originated which is made and sold by that gentleman. Found that he could improve the bellows by inserting a tin chamber in the body of the table, in which to compress the air, and thereby produce a constant, steady current of air. At that time, he did not desire anything better for soldering purposes. On account of changing his laboratory, laid them away for the want of a snug corner to place them in. Then tried "Shaw's Artisan;" but found steam, fire, and teeth too much to attend to in connection with soldering a difficult piece of work. Now uses the bellows again, with a slight alteration of the blow-pipe which belonged to the "Artisan," with Shaw's heater, thus keeping up two gas flames on the work during soldering, of which he has perfect command; and thinks he has the "ne plus ultra" of a blow-pipe for dental purposes.

He observed that the flowing of metal was more mellow when the mouth-pipe was used. He attributed this to the moisture of the breath, which he also learned was the case when steam was thrown into a stack of metal at the foundery.

Dr. Kingsbury remarked that the subject of the essay—the blow-pipe—was invested with special interest; and it was not to be wondered at that some of the members were quite eloquent, and waxed *warm* in the discussion of it. At the time he was initiated into the mysteries of the dental laboratory, the plain mouth blow-pipe was in general use. The first improvement on that was in the shape of a bulb, equidistant from each end, to arrest and hold the vapor of the breath and superabundant saliva that the exhausted and almost distracted blower was apt to force through the pipe on his work. But even with that improvement, he always regarded it as a most laborious and unsatisfactory instrument.

The eolipile or self-acting alcoholic blow-pipe was certainly a great acquisition to the dental laboratory. The first instrument of this kind that he ever saw or had any knowledge of, was at the office of Dr.

Horace Wells, in the City of Hartford, Conn., in 1839. He explained it, and demonstrated its practical value. From him he procured a copper globe and pipe, brought them on to Philadelphia, and had the instrument completed by Mr. Warner, an artisan who resided for many years in Merchant Street, and who was widely known to the members of our profession in those days as a man skilled in the manufacture of gold and silver plate and wire for dentists' use, and possessed of a valuable *secret* in *doctoring* gold clippings and filings. The instrument proved a most efficient one, and was used by him for many years with great satisfaction. It was in all essential points similar to the instrument of more modern construction, having a safety-valve to guard against accident.

It was but a short time after this that, on visiting Mr. Warner's shop, he saw a number of these blow-pipes; and their adoption by the profession soon became quite general. He did not claim for his esteemed relative, the late Dr. Horace Wells, who, as you all know, was the *true* and *acknowledged* discoverer of *anæsthesia*, the *invention* of the self-acting alcoholic blow-pipe; but there was no doubt that its modification and adaptation to the dental laboratory was due to him. He stated to him (Dr. K.) that he got the idea from a blow-pipe of much larger size, but of similar construction, that was in use in the chemical laboratory of Washington College, now Trinity College, of Hartford; and his perceptive and inventive genius at once led him to appreciate its adaptation and value for dental purposes. He deemed it no more than justice to the friend of his early years to mention these facts, and to make these remarks.

This instrument was used by Dr. K. until 1846, when he met with a fancy English glass-blower, who had a pneumatic blow-pipe, the action and economy of which struck him as just the thing for the dentist's laboratory. According to his statement, it was the joint invention of himself and the celebrated Dr. Lardner. Whether the genius of that truly scientific man was concerned in it or not, he could not vouch; but the apparatus was one of the most simple and effective he had ever met with. It was inclosed by woodwork, so that the secret of its construction could not be obtained without the consent of the owner, who fully appreciated the value of the apparatus, and was not at all inclined to reveal its mysteries for the public good.

After conciliating his favor by the purchase of a number of his wares, he consented to show his blow-pipe, and explain its mode of operation. Dr. K. soon had one constructed, had used no other kind of blow-pipe since, and could not desire a better one.

The lateness of the hour forbade a detailed description of it on that occasion. He would perhaps at some future time furnish a particular description, with drawings for the benefit of the profession. He would,

in the mean time, be happy to show the one he has in use to any member who felt disposed to call at his laboratory and examine it.

Dr. McQuillen said, he fully concurred with Dr. Gorges in the opinion that much valuable time was lost and materials destroyed by students and practitioners from the want of a proper knowledge of the scientific principles involved in the employment of the blow-pipe.

Many persons, from an ignorance of the process by which *respiration* is effected, appear to be incapable of learning how to drive a continuous current of air from the mouth through the blow-pipe; and yet nothing was more easy when the difficulties are once surmounted than to do it for quite a long period, and with little or no fatigue to the person engaging in it.

In such operations, it was necessary to remember that *respiration* is divided into two acts—*inspiration* and *expiration;* and all that was required when using the instrument was to learn to make *full, deep, and rapid inspiration* through the nostrils without taking the pipe from the mouth, and then to drive the air, in the act of *expiration*, gradually but forcibly through the pipe on the flame, alternating these acts in a calm, regular, and methodical manner. It generally required time, patience, and many trials on the part of the novice in learning to use the instrument; but the difficulties once removed, if others felt as he did, they would rather enjoy the operation than otherwise.

He was decidedly favorable to the use of the mouth blow-pipe, and regarded its employment as beneficial to the dentist, for the following reasons: The exercise increases the *capacity* and volume of the lungs, and by the *forcible inspiration* and *expiration* of air which takes place under such circumstances, an opportunity is afforded to drive out or exchange a large portion of what is denominated by physiologists *residuary air*. The *capacity* of the lungs means, according to Mr. Hutchinson, "that quantity of air which an individual can force out of his chest by the greatest voluntary expiration after the greatest voluntary inspiration." This author, who had paid considerable attention to the subject, had found that "the mean capacity of 172 males, under the height of five feet eight inches, was 220 cubic inches; while that of 82 males, from five feet eleven inches to six feet, was 255 cubic inches. For every additional inch of height, (from five to six feet,) eight additional inches are given out by a forced expiration."

The lungs were never completely emptied of air, even upon the most violent expiratory effort; and the remaining portion is therefore denominated *residuary air*. It is upon the presence of this air that the lightness of the lungs depends, which enables them to float upon water. The hydrostatic test of infanticide was also based upon this circumstance, for no mechanical or other power can dislodge the air from the organs after they have once been distended by a full inspiration.

While recommending the employment of the blow-pipe as an excellent means of exercise for the lungs, if required to use it a great deal, he might prefer some other apparatus. With regard to the distinction between *combustion* and *respiration*, there could be no doubt that in *combustion* the *oxygen* was *burned up*, while in *respiration* an *exchange* of gases merely takes place, *oxygen* being *inhaled*, and *carbonic acid gas exhaled*. It was formerly asserted that the lungs served as a furnace to the body, and that the oxygen absorbed during inspiration was rapidly burned up there, and the heat thus generated was distributed to every part of the system. A more fallacious or unphilosophical theory could hardly have been advanced. *Combustion*, it was true, did take place in the lungs; but not to a greater extent there than in other parts of the economy. Calorification, or the warming of the body, was due to the fact that the *oxygen* absorbed by the lungs during *inspiration* was distributed by the arteries and capillaries to every part of the organism, and there coming in contact with the broken-down tissues or *carbon*, a chemical union takes place, and carbonic acid is formed, resulting in the liberation of the latent caloric resident in each element, upon the principle that when two elements are brought together having an affinity for each other heat was evolved.

The theory advanced that the air exhaled from the lungs was unfit to be used with the blow-pipe, on account of the carbonic acid gas present, was quite plausible as an argument; but to what extent it was tenable as a fact, he could not pretend to say.

Dr. Lusson uses the blow-pipe of Dr. Calvert, the peculiarity of which consists in having a supply of gas enter midway of the pipe, which is ignited at one extremity, and supplied with additional oxygen from the other by means of the lungs, as in the common instrument. He considered it preferable to any blow-pipe he had ever seen or used. From the breadth of flame the work is readily heated, and the liability of cracking of the teeth very much diminished; besides, the difficulty of discovering exactly the proper point for directing the current in the use of the ordinary pipe is here entirely obviated.

Dr. Neall uses a force pump in connection with the pipe.

Dr. Flagg moved that the various kinds of blow-pipes be exhibited, and a practical demonstration of their principles given at an adjourned meeting, to be held on Tuesday evening, September 15th. Carried.

Adjourned.

An adjourned meeting of the Odontographic Society was held on Tuesday evening, September 15th, 1863, at eight o'clock.

Vice-President, Dr. Kingsbury, in the Chair.

Dr. Gorges, the essayist of the previous evening, gave a practical demonstration of the various blow-pipes treated of in his paper, the dif-

ferent apparatus having been kindly furnished by Dr. S. S. White, in compliance with the request of the Society.

Dr. Lusson also exhibited the gas blow-pipe of Dr. Calvert's pattern, which is designed to heat and solder the work by separate flames. Being provided with two burners, the high temperature of the work is maintained independent of the blowing necessary for soldering.

Prof. Morton said that in the ordinary alcohol blow-pipe, the explanation of its utility is as follows: The jet of alcohol vapor rushing into the flame of the lamp, carries with it a draught of air, so hastening the combustion by a freer supply of oxygen. Where air is driven through the flame by the mouth or table blow-pipe, the same effect is more directly reached.

The apparatus already in use leaves nothing to be desired in the ingenious adaptation of parts. If it is desired to produce a greater heat than may by these means be developed, we must call to our aid more powerful agents than alcohol and air. These have been introduced in the oxy-hydrogen blow-pipe. Here, in place of alcohol, we burn the far more combustible substance hydrogen gas, and in place of air, (which contains but one-fifth part of oxygen, the remainder being nitrogen, which does not aid the combustion, but, on the contrary, cools down the flame by its presence,) we drive into the flame pure oxygen gas.

As early as 1802, Dr. Hare had published a memoir explaining the rationale of the heat developed by the union of the elements of water, the means of burning them without danger, and the intense character of the light and heat which might be so developed.—(*Tillock's Philos. Magazine*, London, vol. xiv., and *Annales de Chimie.*) These memoirs were accompanied each by a plate representing the apparatus. Subsequently, in 1817, an account was also published by him of the fusion of strontia and vaporization of platinum.—(First part, sixth vol., *Amer. Phil. Transactions.*) This apparatus was used by Mr. Rubens Peale in his father's museum for ten years between these dates.

Professor Silliman published in May, 1812, in *Tillock's Magazine*, a memoir of many important experiments performed with this apparatus of Dr. Hare, which he says "has been in common use for class experiments in Yale College for eight years."

In 1819, Dr. Clark, of Cambridge, published a book entitled *Clark's Gas Blow-pipe.* In this he ignores Hare's publications,* and claims all the credit for himself and a Dr. Thompson, of Glasgow, who, according to his own showing, only contrived to blow up his apparatus in some futile attempts in this direction in 1802, the date of Hare's *publication*, his apparatus and experiments being made a year before. Clark used

* With the exception of a slighting reference to the memoir in the *Annales de Chimie.*

the mixed gases compressed into a strong metallic vessel, explosion being avoided by safety tubes.*

At the same time, there was published by Dr. W. Henry, F.R.S., Vice-Pres. of Lit. and Phil. Soc. of Manchester, etc., a work on chemistry, in which he refers to Hare's essays; but speaks of Clark as having improved the apparatus and obtained better results, citing the vaporization of platina as an example, though this had been accomplished and published by Hare twelve years before.

This apparatus of the above-described parentage consists of a double concentric nozzle—that is, of a small pipe inside of a large pipe. From the outer pipe, hydrogen escapes and is ignited; and when the oxygen is turned on to the inner pipe, it escapes in the centre of the hydrogen flame, so supplying it with this best supporter of combustion, and causing it to develop its greatest possible amount of heat.† The intensity of this heat was then shown by the fusion of platina, the cupellation of silver, and the burning of iron, copper, etc. The adaptation of this intense flame to the production of light, by causing it to impinge upon a cylinder of lime, was then exhibited, and some of its practical applications were described and illustrated. Thus, its utility for the display of microscopic sections and specimens, as well as diagrams and photographs, was practically demonstrated, as also some of the pleasing effects produced by the so-called stereopticon. Lastly, its application for the production of the ghost exhibitions, at present so popular, was explained, and a ghost of similar character introduced.

After this entertaining and instructive exhibition, upon motion, a vote of thanks was tendered Prof. Morton for the opportunity so kindly afforded the Society of observing his valuable and scientific experiments, for the interest manifested in its favor, and the trouble incurred in the preparation of the evening's entertainment.

Dr. McQuillen read a letter which he had received from Dr. N. W. Kingsley, of New York, that morning, (in response to one which he had sent a few days before,) stating that he had anticipated being present at the meeting, but circumstances had prevented. He therefore moved that an invitation be extended by the Society to Dr. Kingsley to be present at the next monthly meeting, October 6th, and favor the members of the Association with a detailed description of his "artificial velum," together with the various appliances necessary for its construction. The motion was unanimously adopted.

On motion, the meeting adjourned.

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* A very dangerous process, notwithstanding, which has led to some fatal accidents since his time.

† The gases are supplied to both tubes or nozzles from gas-bags or other forms of gas-holders.

PENNSYLVANIA ASSOCIATION OF DENTAL SURGEONS.

REPORTED FOR THE DENTAL COSMOS BY G. W. ELLIS, M.D.

THE first monthly meeting of the Association, after the summer adjournment, was held on Tuesday evening, September 8th, at eight o'clock.

President, Dr. Fouché, in the Chair.

The following paper was then read by the evening's essayist:—

"CAPILLARY ATTRACTION AND CIRCULATION."

BY T. L. BUCKINGHAM, D.D.S.,

PROFESSOR OF CHEMISTRY AND METALLURGY IN THE PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

MR. PRESIDENT:—You did me the honor to appoint me to read an essay before this Association on some subject connected with dentistry, leaving the choice to me. I have selected for the subject "Capillary Attraction and Circulation." I do not claim to have made any new discoveries, nor do I expect to present all that is already known. But what I wish to do is to call the attention of the members present to the difference between capillary attraction and capillary circulation. I would call their attention to this subject, as I consider it one of the most important that can be presented; it lies at the foundation of all our chemical and physiological laws. It has much to do with solution and nutrition—in fact it is by solution that materials are prepared suitable for nutrition; and the solution is in a great measure caused by capillary attraction.

And for another reason I call your attention to it. We have frequently heard members of this Association, when they had failed to explain satisfactorily the circulation in certain parts, endeavor to explain it by attributing it to capillary attraction as seen in inorganic bodies.

I consider the two phenomena to be caused by entirely different forces. Capillary attraction is a force in nature acting upon atoms of matter of different kinds, and is supposed to be a modification of the cohesive force; one of the forces belonging to matter. It originated when matter was first created, and will continue so long as it is in existence.

The force that controls circulation is a vital force, and must be derived from a parent, and when once matter has been deprived of it, it cannot be renewed again until the matter passes through a living body; while one is a property of matter, the other appears to be a force acting outside of matter, and only using it to make the force manifest.

I do not wish to be understood as saying that the force of capillary attraction is entirely wanting in living tissue. I believe it to be present in its full force, only controlled by a greater force, just as gravitation continues in the sap of plants, while the sap is carried upward against it by a greater force.

"Capillary is derived from capillus, hair. Resembling a hair, fine, minute, small in diameter, though long, as a capillary tube or pipe; capillary vessel in animal bodies, such as the minute ramification of the blood-vessels." (*Webster.*)

The word capillary, then, only signifies a small tube or vessel; but it is not necessary that tubes or vessels be used to show the phenomenon of capillary attraction: it may be seen in any substance where the particles are small and close together, and the fluid is capable of adhering or wetting the solid, as when water ascends through sand.

The fluid must have an affinity for the solid to present this phenomenon; it must adhere to it with greater force than the atoms of the fluid to each other. When a glass rod is dipped vertically into water, the water wets the rod and rises on the sides above the level of the water in the vessel. If the rod is drawn up until the end is a very little distance above the water, there will be a body of water raised above the surface; this body of water can be raised until the cohesive force between the atoms of water is no longer sufficient to keep up the connection. The particles of water have a stronger adhesion to the glass than the cohesive force between the particles of water themselves.

It is not necessary that water and glass be used to show the effect; any other solid or fluid may be used, so that the fluid has an affinity for the solid and will wet or adhere to it; but there are scarcely two fluids that have the same affinity for a solid, or will rise to the same height in a capillary tube. In a tube of glass where the height of water would be represented by one hundred, nitric acid would only rise seventy-five, and alcohol a little over forty. Fluids that will not adhere to or wet the tube, will not rise in them; but on the contrary are depressed. If a small tube is dipped into mercury, the mercury will be lower in the tube than it is in the vessel, and the surface of the mercury in the tube will not be concave, as it is when water is used, but will be convex, and around the tube, on the outside, the mercury will be depressed, showing that there is a repulsion between the glass and mercury. The same effect is produced when a glass tube is greased, and dipped into water.

This capillary force is very powerful; rocks are split by drilling holes in them, and driving in the holes dry wood; they are then wet, when the wood swells with sufficient force to split the rocks.

This force also in solution breaks up the crystals, as when loaf sugar or any other crystalline substance that will dissolve is put into water;—by capillary attraction the water passes in between the crystals, forcing them apart, until probably the ultimate combinations of the atoms are all that are united together, and these being so very small, are not visible, and being suspended in water forms what is termed solution.

A sponge illustrates the capillary attraction very beautifully; the water adheres to the sides of the cells, and they not being one continuous tube,

but divided by partitions, the water is retained in these cells in larger quantities than it would be if they were tubes; when the sponge is compressed, the cells are diminished in size, and the water forced out.

It is by this force that porcelain teeth absorb and retain fluids in the small cavities in them. The manufacturers prepare some of their materials in a very coarse condition, in order to give their teeth a granular and more natural appearance. After the teeth are burned, small cavities are left in them, which in some teeth may be seen through the enamel, in others they are so small as not to be visible to the unassisted eye—nevertheless, large enough to retain a fluid. These cavities, when the teeth are new, are empty, but after being worn a short time they become filled with a fluid, and when heated a second time, this fluid is converted into steam, and as the steam cannot escape as fast as it is generated, the teeth break from its pressure in the cavities; some teeth are so porous that they will break into hundreds of pieces. It is, therefore, better always to heat up an old piece of work very slowly; allowing it to remain several hours at a temperature a little above boiling, so that the steam from these cavities may have time to escape as fast as it is generated.

I now pass to another form of the capillary force. *Osmose* (exosmose, endosmose) is a transmission of one fluid into another through some porous medium. If a bladder is filled with a strong solution of salt, and then suspended in a vessel containing pure water, in a very little time the salt will be found to have passed through the bladder into the water in the outer vessel, at the same time the water will have passed into the bladder; and if we examine the process carefully, we may notice that they have not passed equally. If the bladder has been suspended at the commencement, so that the salt water on the inside stands exactly level with the pure water outside, in a little time the water in the bladder will be seen to rise above the surface of the water on the outside; that is, the lighter fluid will pass into the more dense, faster than the dense passes out into the lighter; this is usually the case with few exceptions. It is not necessary that an animal membrane be used to show this phenomenon, nor that the liquids should be so close together. Two tumblers filled, one with water and the other with alcohol, set close together, with a thick piece of lamp wick connecting the fluids, the water will pass over into the alcohol, and the alcohol into the water through the wick. Instead of the bladder or lamp wick, a piece of porous burnt clay or plaster may be used. The conditions necessary to produce the phenomenon are—

"1st. That the liquids be susceptible of mixing.

"2d. That they are of different densities.

"3d. That the membrane or wall (septum) which separates them is permeable to one or both liquids."

Neither of the processes just named can be called circulation; for a

fluid to circulate, it is necessary that it should return to the place from whence it started, as the blood circulating in the body starts from the heart and returns to the heart again, after having passed through the arteries, capillaries, and veins; or as the sap in the vegetables passes from the roots to the leaves, and then back again to the roots.

In animals there is a central organ (*the heart*) to force the blood through the arteries, and by it in a measure the blood is drawn from the veins; but it has not been definitely settled to what extent its action affects the capillary blood-vessels. Carpenter states: "Still there is evidence that the movement of the blood through the capillaries is not entirely due to this, (*the heart's action*,) since it may continue after the cessation of the heart's action; may itself cease in particular organs when the heart is still acting vigorously, and is constantly being affected in amount and rapidity by causes originating in the part itself, and in no way affecting the heart."

But if the heart does not cause the flow of blood through the capillaries, then to what is it due? We cannot explain it by capillary attraction; there must be some force in capillary vessels themselves which causes the blood to flow through them; and this we are led to think is the case from what we know of the circulation in plants. The roots first select the crude sap from the earth, which is carried through a series of cavities or cells up to the leaves, where it undergoes a change from the exposure to light and heat; the crude sap is there changed into an elaborated fluid, which contains all the materials to build up the plant, and returns back again toward the root, building up the several parts as it goes. Its return is made through the same series of cells that it passed through in going upward. The crude and the elaborated sap are mixed together, and yet one follows in its course upward, and the other downward, the one containing the crude materials, the other having been changed into the building fluid itself. That this circulation is due to a vital force is very evident, for as soon as the plant is deprived of its vitality, the circulation ceases. Tons of fluid will ascend in a living tree, one or two hundred feet in height; but if the vitality of the tree is destroyed, the circulation ceases. "No physiological fact seems to the author to be more clearly proved, than the existence in the lower classes of animals, as well as plants, of some power independent of a *vis à tergo*, by which the nutritive fluid is caused to move through their vessels." (*Carpenter.*)

There is another circulation—if we may be allowed to call it such. I allude to the circulation outside the capillaries; the blood, in passing through the arteries, veins, and capillary blood-vessels, does not nourish or build up the tissue; they are only vessels to conduct the nutrient blood to the parts. It is only after this nutrient fluid has left these vessels and circulates in or around the cells themselves, that it begins to perform its destined functions; and as there are parts where there are no capillary

vessels, this fluid must pass from cell to cell by an osmotic action controlled by the vital force. We see this action in the cartilages and the dense osseous structures, especially in the dentine, where there appears to be no vessels whatever of sufficient size to conduct a fluid through it. If we refer again to the vegetable circulation, we may see that it is not necessary to have vessels that a circulation may go on. In the vegetable, each cell performs the function of a vessel or tube; the sap is taken up by one cell, and transmitted to another through a partition, and to rise an inch it sometimes has to pass through several hundred partitions. But there is a difference between the cells in the vegetable and animal bodies; the vegetable cell appropriates the nutrient fluid to build up the structure; but when once appropriated, it is not again cast out.

The cells of the animal tissue not only receive this nourishing fluid and transmit it to these neighboring cells, but they appropriate a portion to their own use; and, what is more remarkable, after they have used it for a short time, they cast it out and supply its place with fresh material. We have nothing like this in inorganic bodies; and in vegetables there is only an approximation to it. The vegetables prepare the materials for building up its structure; but when once deposited, it is not thrown out again; so that when a plant ceases to grow, it dies. In inorganic bodies, there may be a deposit by a kind of galvanic process, by which they may become more dense in structure, or accumulate on the outside so as to get larger; but they never prepare the materials to build up their structure.

Dr. Buckingham said he had selected the subject on which the paper just read treated, to bring before the Association the circulation in animal tissue, but more particularly the circulation in dentine, as the different tissues of which the human body is composed are all made up of living cells. These cells have to receive nourishment. This nourishment must come by the circulation. It is therefore of the greatest importance to understand the circulation; and if we cannot explain every part of it, let us at least know all that is known on the subject.

The teeth of persons who are apparently in health will sometimes commence to decay, and not only a single tooth, but a number about the same time. There is apparently no fault in the system; all the secretions appear to be healthy and in sufficient quantity, so that the decay cannot be attributable to the decomposition of them in the mouth. The cause must be looked for in the dentine, or the circulation in it; in such cases it is a local disease. In cases where the person has had some disease affecting the whole system, as in cases of typhoid fever, many of the teeth will commence to decay; and what is peculiar in these cases, when we excavate them we have to remove a very large portion of the dentine; even where the external cavity is very small, the dentine is decomposed very far in. He thought the decomposition was in a measure due to the want of a proper nourishing circulation through it.

He was once asked by an old practitioner, after talking on this subject, if he thought, when he became sick, his teeth could become sick. To which he answered, without hesitation, yes.

Dr. Barker said he considered the subject introduced by Dr. Buckingham to be one of great interest, but one which, in order to discuss properly, would require much thought and preparation; and believed that no subject could be more interesting than the consideration of circulation as seen in the animal, vegetable, and mineral kingdoms.

He would briefly call attention to the circulation as seen in the human economy, now so perfectly illustrated since the introduction of the microscope. The circulation had been appropriately likened, by some physiologist whose name he could not then recall, to a stream of water passing into a swamp filled with vegetable and animal life, each requiring some different element or combination of elements for its support and nutrition. The stream of water would permeate the swamp, and each would extract from it the materials necessary *only* for its nutrition, and thus each would receive an adequate supply; and the same action takes place in the body, each tissue selecting its own appropriate material.

In the human economy, we find three distinct circulations, each dependent and yet still independent of one another. These are denominated the arterial, the capillary, and the venous; of these, he should call attention to but one—namely, the capillary. The first change that we observe in the arteries, previous to their being lost in the minute capillaries, is the absence of the external coat. The middle coat is next found to be absent, leaving but a simple, tubular, homogeneous membrane, which is the membrane common to the capillaries. The motion of the blood in the capillaries differs from that in the arteries. In the latter, the blood obeys the impulse of the heart, causing a distinct pulsation; while in the former, the current is uniform, the microscope disclosing numerous streams passing in every direction.

There is also a peculiarity with regard to the white and red globules: the white globules move more slowly, and seem to cling to the sides of the vessel; while the red flow more rapidly in a continuous stream in the centre. The globules also seem to be possessed of flexibility, as they will noticeably change their shape while passing angles and loops in the capillary tubes. At the capillaries is the point where nutrition takes place in the human economy; all nutrition, however, being "extra-vascular." And here is shown one of the beautiful provisions of nature in the formation of the capillaries in the form of an interlaced net-work, termed the capillary plexus; so that all the blood can be passed over an extended surface, enabling the parts to extract the necessary nutrient material.

The inflammatory process, so beautifully shown on the web of the frog's foot under the field of the microscope, discloses the fact of the distinct circulation in the capillaries. We first see at the commencement of the

process a change in the current, it being perceptibly lessened; a more sluggish current continuing until complete arrestation of circulation or "stasis" is induced. This change is not due to the diminished force or current of arterial blood, as this may be unchanged. Neither is it due to the mechanical obstruction of the capillaries, as these are enlarged. It is then probably due to a loss of force in the capillaries themselves, a force which is resident in them, and which continues even after death, emptying the arterial blood into the veins, and leaving the arteries devoid of blood. Another fact, demonstrating the distinctness of the circulation, is seen in the rapidity of the circulation, it being in the capillaries much slower than in the arteries.

Dr. Buckingham said it was necessary for the fluids to pass out of the vessels to nourish the tissues, as the corpuscles could not pass out. They did not themselves contribute to the nourishment any further than to carry it to the part. He had no doubts about the fluids in the red corpuscles being changed as they passed through the capillary vessels by an osmotic action, some of their contents passing out while other fluids passed in, and were carried off by the circulation. He thought, as the whole body was made up of cells, the nourishment of the cells in the different parts was very similar. The blood (the red before white corpuscles, and liquor sanguinis) was carried into the cells, and then the cells selected what was necessary for their support. Some parts were very vascular, the blood passing through them in almost every direction; while others, as the cartilages, and more especially the dentine, had no vessels passing into them large enough to admit the corpuscles, the fluid portion only circulating through them, and this circulation probably only from cell to cell.

Dr. Townsend believed the truth of the saying, "When a man is sick, his teeth are sick." He mentioned the case of a young lady, of good constitution, whose family were remarkable for excellent health and perfect teeth; her mouth was almost entirely free from the ravages of caries; yet after an attack of typhoid fever, fifteen or twenty cavities were discovered; the gums shrank from the necks of the teeth, and the tenderness of the dentine was so very acute, that he had much difficulty in introducing fillings; and when successful, found them to prove serviceable only for a very short period.

Dr. Peirce said that he had been much interested in the paper just read; and particularly so far as the subject was applicable to the dental organs. He believed no one would doubt the propriety of the terms predisposing and exciting causes of decay; or, as they are sometimes called, constitutional and local. The preservation of the teeth depending to a great extent upon the ability of fluids to circulate through their tissue, he thought we should find that whatever materially interferes with nutrition affects the teeth proportionately with the other organs,

and in any constitutional disturbance he believed the teeth participated to a greater or less extent with the soft tissues. By this abnormal action the dentine becomes affected, and, if to an extent sufficient, loses its vitality, and with the loss of vitality, the power of resisting the action of the fluids surrounding them. If those fluids are, as is frequently the case, in a vitiated or acid condition, the destruction is effected. He knew it had often been asserted, that the enamel designed to protect the dentine was void of vitality—hence could not be influenced by any constitutional disturbance or vital action. Such, however, is not the case, for chemical analysis has shown that the enamel contains over three per cent. of organic matter, and the increased density which takes place in this tissue as the child advances to youth, and from youth to manhood, gives evidence of a vital action. By the death of the dentine the enamel loses its support, becoming necessarily predisposed to the action of the surrounding fluids. That this abnormal condition of the dentine, and subsequent loss of vitality, may be induced by external causes, is evidence of the permeability of the tissue under certain circumstances from without; while by carefully noting the manner in which decay progresses, we have evidence that this permeating fluid is the destructive agent. Take, for instance, the shape of the cavity as it is found in the enamel, invariably following the course of the fibres, and progressing most rapidly in such teeth where those fibres are imperfectly united; as it advances, coming in contact with the dentine, the same peculiarity is noticeable, the decay first attacking the walls of the tubuli, and following their course both laterally under the enamel, and converging as it approaches the pulp cavity.

He alluded to the marked degeneration which had taken place in the teeth of a patient, caused, he believed, by the change from an ordinary domestic in the house, to confining herself to the duties of the milk-house. The *health* first partially giving way—the defect in the dental organs following as a consequence.

Dr. Barker, in reference to the nutrition of dentine, said that the tubuli undoubtedly performed the office of the capillaries for that tissue, the liquor sanguinis of the blood, which contains the necessary pabulum, being carried into that structure. He thought that this circulation might either be increased or decreased; either departure, however, from a normal standard tending to predispose the tooth to disease from the influence of external exciting agencies. This was, he thought, the only way that certain anomalous cases could be explained, where, for instance, persons had grown to manhood, and perhaps to middle age, without any token of tooth decay; and after one attack of sickness, the teeth would seem to be changed in structure, and rapidly become carious.

Dr. Buckingham remarked, in answer to a question whether he thought teeth of old persons contained as much animal matter as the teeth of

young persons, that he had not thought on the subject before the question was asked. He knew it was usually stated that the teeth of the young contained much more animal matter than the teeth of the old, but his answer would depend on what was called animal matter. The soft parts are made up of what is called solids, and fluids or watery portion. He thought the teeth of old persons contained as much of the solid portion of the animal matter, and less of the fluids; the earthy matter took the place of the fluid. If we dissolve the earthy matter out, which can be easily done with diluted hydrochloric acid, the tissue left appears as firm from an old person's tooth as it does from a young one. He therefore thought the solid animal matter was as much in the old as in the young; the difference was in the fluids and earthy portions.

Dr. Wildman, in reply to a question, stated that porcelain teeth could be made so compact as to prevent the absorption of moisture; to accomplish which result, the materials entering into their composition must in baking become vitrified and compact. Porcelain teeth are composed of what are termed fusible and infusible substances: the fusible are felspar and glass, or fluxes; the infusible, quartz, kaolin, and other clays of a similar character. The infusible serve to support the shape of the tooth, and have been termed the bone; while the fusible, which flow, cement and clothe these, have been denominated the flesh. There are two classes of porcelain teeth—the opaque and translucent. The opaque has given place to the translucent, the latter possessing a much more life-like character. To make a compact opaque tooth, the materials entering into its composition must be treated differently, and used in proportions different from those necessary to make a good translucent tooth. In making an opaque composition, the infusible substances predominate, or are in greater proportions than when we desire to make a translucent one. In this case, all of the materials must be levigated extremely fine; the object of this is, as the infusible substances predominate, to reduce the granules, so that they shall come in close contact, and that the minute intervening spaces may be filled by the fusible portions of the compound, cementing the whole into a compact, homogeneous mass. To neglect this precaution, the granules of the infusible material would only touch at comparatively distant points, and only be cemented at these points; the granules being coarse, would not become vitrified; the body would be what is termed dry and husky, with minute cavities through the substance of the composition into which moisture would permeate.

In making translucent compositions, in which the fusible material predominates, advantage is taken of the property of good felspar—that the larger particles will become vitrified and retain their shape, while at the same temperature the finer ones will flow and act as a cement; these larger particles will in a measure take the place of the infusible materials

in retaining the shape of the tooth, and at the same time possessing the advantage of being translucent. He prepares translucent compositions in this manner, levigates the quartz and kaolin, and other clays extremely fine; part of the felspar is also ground very fine, the remainder left comparatively coarse. In mixing these, the kaolin, quartz, and fine felspar enter into the interstices between the larger granules of the coarser felspar, filling up the spaces; and in fusion, the finer particles of felspar flow, enveloping the kaolin and quartz, at the same time cementing the coarser particles of felspar (which is now translucent) together, making the whole mass compact and impervious to moisture.

Dr. Barker referred to cooling work rapidly, and said he had good reason to suppose that those who cooled their pieces of work immediately after soldering, by putting them in boiling water, injured the teeth, so that any subsequent attempt to resolder them would most likely terminate in the breakage of several, if not all of the teeth; at least, such had been his experience in repairing work from the hands of those who thus cooled their work.

Dr. Buckingham moved the selection of a subject for discussion, at the next monthly meeting. Carried.

Dr. Barker moved the consideration of "Palatine Defects," partially with the view of inducing his friend, Dr. Wildman, to present the models of and describe a very interesting case which he had under treatment. Carried. Adjourned.

REVIEW OF DENTAL LITERATURE AND ART.

BY J. H. M'QUILLEN, D.D.S.,

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Oxy-Hydrogen Microscope.—Of the many and varied directions to which Professor Hare's valuable discovery of the compound blow-pipe has been applied, viz., the melting of metals formerly regarded as infusible, the Drummond light, employed for marine illumination, etc., none is more important, although but little if any practical use has as yet been made of it, than its adaptation to the microscope. By this combination, the most minute objects are thrown upon a screen in perfect and accurate detail, on a scale which enables a lecturer, fully acquainted with his subject, to present a description, which, with such illustrations, cannot fail to make a decided and indelible impression upon the mind of the student. Sections of bone, teeth, and the other tissues of the human economy can in this way be demonstrated in the most satisfactory manner. I am not aware that the instrument has ever been applied to the illustration of microscopical objects in the regular course of lectures in any medical or dental college; but in the ensuing winter, an effort will be made to ascertain what practical value it possesses as a means of demonstration.

The Principles and Practice of Dental Surgery. By Chapin A. Harris, M.D., D.D.S., late President of the Baltimore College of Dental Surgery; member of the American Medical Association; author of Dictionary of Medical Terminology and Dental Surgery, etc. etc. etc. Eighth edition, enlarged and revised, with three hundred and twenty illustrations. Philadelphia: Lindsay & Blakiston, 1863.

It is the peculiar privilege of those who, engaging in *general literature*, and giving to the world productions of superior merit, not to have their works superseded. Such, however, is not the case with the *literature of science.* The very highest work produced in any department of science is but a provisional work—a book upon trial or sufferance. Let a later work appear, in which its teachings are placed in better order, or which embodies the discoveries or improvements made since its publication, and instantly it is superseded; whereas the feeblest work in *general literature*, surviving at all, survives as finished and unalterable. Hence follows the necessity of embodying in new editions of a standard scientific work all the improvements and additions which have been made since its last issue in the department of science to which it belongs.

This holds with peculiar force in dentistry, which, as a science, is comparatively young, and its practitioners but little trammeled by authorities, and therefore constantly reaching forward for something new. Discoveries and improvements of the most important and varied character are thus being made each year; and a work embodying at the time of publication all the important points of science and practice of that period, demands in a few years revisions and additions corresponding to the progress made. Thus, five years ago, at the time of issue, the seventh edition of Harris' Principles and Practice of Dental Surgery embraced, as near as it was possible for a single work to do, all that is comprehended under the title which it bore. It was a work which had cost its author much labor, research, and patient and long-continued application to enable him to present it in a manner satisfactory to himself and others, and to become a work of decided benefit to the profession at large. I do not wish to be understood as by any means indorsing everything contained in it, or asserting that it was in every respect *exhaustive* of the subjects treated on. This it was impossible to effect in a single work; for the various departments embraced under the head of dental science had assumed such proportions, long before that, as to demand special text-books for their complete and perfect elucidation. But as far as it was practicable for any single work to do, it met the various requirements of the profession, and has justly been regarded as a valuable and indispensable book.

The improvements made in some departments since the last issue have, however, been of such a character as to revolutionize, to a great extent, the practice of dentistry in several essential particulars. It is only neces-

sary to allude to the introduction of *Osteo-Dentine and Wood's metal in Operative dentistry, the Vulcanite in Mechanical dentistry, and the latest improvement of all, Dr. N. W. Kingsley's eminently ingenious Artificial Velum and Palate,* to find ample confirmation of the assertion. The profession at large may have failed to recognize the importance and value of the materials named, and some of the articles may not be all that is desired, or all that can be accomplished yet; but that they are efforts in the right direction, every one who has employed them will admit.

The recognition of the foregoing facts has induced the publishers of the work under consideration to get out a new edition; and in the consummation of this end, they have been fortunate in securing the co-operation of several gentlemen who were not only intimate friends of the lamented author, but are also widely and favorably known to the profession in the various directions to which they have devoted their time and energies for many years past.

A careful examination of the early sheets of the work, received about the first part of September from the publishers, induces me to present the following preface to this edition as embodying a fair and reliable statement on their part:—

"The publishers, in preparing this, the first posthumous edition of the late President Harris' Principles and Practice of Dental Surgery, have spared no pains to make it in every way worthy of its own high reputation and that of its distinguished author.

"It has been subjected to a very thorough revision by competent professional gentlemen, and will be found to contain many and important additions, bringing the work fully up to the present state of dental science and art.

"The publishers desire to acknowledge the valuable assistance rendered by Professor Austen, to whom they are indebted for the entire chapter on Vulcanite, most of the chapter on Soldering, and much new matter in the chapter on Irregularity, and throughout the entire mechanical division of the work. They would also acknowledge important additions by Prof. Christopher Johnston, of the Baltimore College; a valuable section on Artificial Palates, by Dr. W. H. Dwinelle; and a number of useful practical suggestions from Dr. Edward Maynard.

"The illustration of the work has been greatly improved. A few unimportant designs have been omitted; several others have been replaced by improved drawings, and many new illustrations have been added; for a large number of which, they are indebted to the courtesy of Dr. Samuel S. White.

"The publishers lay this edition before the profession in the confident assurance that it will be found to be what its author designed it—'a thorough elementary treatise, a text-book for the student,' and a useful companion and guide for the practitioner."

In the department devoted to the Anatomy and Physiology of the Mouth a very decided change of views is manifested in relation to the *vascularity of dentine.* In the previous edition the author said:—

"Dentine is regarded by most microscopists, especially of human teeth, as destitute of vascular canals, but the author has seen ten or twelve specimens in which their existence was so clearly demonstrated as to leave no room for doubt; a description and drawing of one of which is published in the second volume of the *American Journal of Dental Science*. A similar one was shown to him by Dr. Maynard, of Washington City, and he has a section of a molar tooth made by Professor Blandy, in which several vessels charged with red blood are distinctly seen. Mr. Tomes says he has seen eight or ten sections of vascular dentine, and he has given a drawing of one in which the dentine and cementum are both pierced by vascular canals.

"*Now if vessels have been detected in dentine in so many instances, it seems more than probable that they are always present, though too small and attenuated to convey anything but the thinnest and most serous part of the blood.*"

In the present edition the following position is assumed:—

"*The occasional and exceptional appearance of vascular canals in human dentine does not, however, justify us in regarding that substance as normally vascular.*"

Although not stated, the latter opinion, which is in accordance with the views of Owen, Tomes, and microscopists generally, has no doubt been presented by Professor Johnston, whose perfect familiarity with microscopy would convince him of the untenable nature of the previous views. In the journals and in the discussions of dental societies on different occasions, persons who evidently never prepared a section of bone or dentine, and who perhaps have handled a microscope a few times as a careful child does a costly toy, have descanted in the most emphatic and learned manner upon the vascularity of dentine as an unquestioned fact.

Regarding such views as untenable, and recognizing that a sound basis of practice can alone be found in a correct knowledge of anatomy and physiology, I have on various occasions presented indisputable facts as a proper response to the visionary theories that were calculated to lead others astray. The following is a brief recapitulation of the views advanced on this subject, in a paper presented by me to the American Dental Association in 1862, as the report of the Committee on Dental Physiology:—

"The circulation of fluids in the vegetable kingdom; the fact that nutrition is invariably *extra-vascular*, and that the fluids which nourish the tissue can only escape by transuding through the parietes of the capillary vessels; the phenomena of endosmosis and exosmosis, manifested alike in dead as well as living tissues, due to their *invisible porosity;* the universal operation of this law in all organic structures; the fact that the porous character of the cementum and dentine, though invisible to the naked eye, is readily demonstrated under the field of the microscope; the loss of weight on drying teeth recently extracted; the increase of weight on placing dry teeth in water; the presence of water in the pulp cavities of teeth experimented upon; the absence of it in the phial, are one and

all so many strong and conclusive arguments in support of the permeability of dental tissues.

"The facts and reasonings which have been presented, it appears to me, justify the assertion that human dentine is not supplied with blood-vessels, and that the tubuli, opening as they do upon the walls of the pulp cavity, their contiguity to each other, combined with their division, subdivision, and anastomoses, and the capillary attraction resident in those tubes, afford the most admirable arrangement that it is possible to imagine for the circulation of the liquor sanguinis in every portion of the structure. Indeed, under such circumstances, it would have been a work of supererogation to have placed vessels there."

It is somewhat surprising that, in describing the materials used for filling teeth, no mention is made of *Osteo-Dentine*. The omission no doubt was unintentional, for even if the gentleman who had charge of this department does not regard the article favorably, the fact of its being used as it is very largely by the profession, demands of necessity that decided attention should be directed to its composition, employment, and the various arguments for or against its use.

No important modifications have been made in the description of the manner in which the teeth should be filled. It may be truly said, indeed, that there is nothing more difficult to describe than the manner in which a tooth should be filled so as to secure a clear and accurate comprehension on the part of one entirely unacquainted with the subject. Professor Harris has been quite as successful in this matter as any one who has made the attempt. The only way, indeed, to learn to operate, is to stand by the side of an easy and dextrous manipulator, and after watching his efforts and listening to his descriptions, endeavor over and over again to do the same thing in the same manner.

In the treatment of Alveolar Abscess, the work has not been brought up to the present advanced state of the profession in that direction; the space devoted to the subject is entirely too limited, the prognosis fallacious, and the wholesale extraction advocated unjustifiable.

The most novel, and one of the most important, if not the most important feature of this edition, is the presentation of Dr. N. W. Kingsley's *Artificial Velum and Palate;* for, judging from the description of the instrument, and what is *confidently claimed as having been accomplished by it,* and also from an opportunity afforded, through the courtesy of Dr. Kingsley, of examining the instrument, one may properly and justly assert that this is one of the most remarkable achievements of modern times in the substitution of congenital deficiencies or of losses sustained by that most loathsome and most terribly destructive disease, syphilis.

The following is presented from the pen of Dr. Dwinelle, who has had every opportunity of examining cases in which the instrument has been used for years :—

"In the treatment of congenital fissure of the palate by mechanical means, with a view of improving the articulation, this one fundamental principle must be kept in view. It is not alone the too free escape of sound through the nares that causes the defect of speech; but it is the absence of a flexible curtain or valve, which at times will perfectly close the passage to the nares and direct the sound into the mouth, and at other times allow a portion or all the sound to pass through the nose. It is under such circumstances that all metallic obturators, no matter how ingeniously constructed, are not only clumsy and troublesome contrivances, but ineffectual to accomplish articulation. They serve only to plug the nares, which the patients might do for themselves by stopping the nose with cotton, or by any other simple means, and still be as far from any material improvement of speech as ever. Metallic obturators may make speech easier for the patient, but rarely any more distinct. An elastic flexible artificial velum, to replace the lost organ, is the only mechanical contrivance which can assist in producing this desirable result. To Stearns great credit is undoubtedly due for having demonstrated, by his experiments, that an artificial velum can be constructed which may be worn in the fissure without discomfort, and be made available for accomplishing perfect speech. But to Dr. Kingsley is certainly due the credit of having taken up the matter where Dr. Stearns seems to have left off; to have made such improvements in the perfection and simplicity of the instrument, and to have reduced the manner of accomplishing it to such system, as to leave success no longer problematical and dependent upon chance, but a certainty, dependent only upon the skill of the operator. We can speak from our own knowledge, having seen some of his cases; one in particular, which presented the apparently insurmountable obstacle of the entire loss of the natural teeth, not a tooth left from which any support could be obtained for such an appliance; and yet, in this case, the velum, by the beauty of its adaptation, was not only self-supporting, but actually sustained an entire upper set of teeth with as much firmness as is ordinarily obtained from spiral springs."

After describing the manner of taking impressions, and the general construction of the instrument and its adaptation to the parts, the writer continues:—

"The practical advantages resulting from the wearing of such an instrument have already been demonstrated by years of experience, beyond any question. The organs of speech alone are congenital; speech itself, resulting from their use, a faculty which man acquires only through practice. It follows, then, that where the organs of speech are perfect, the only limit to their exercise is the capacity and perseverance of the patient.

"With a fissure of the palate, distinct articulation is impossible. An artificial velum replaces, as far as practicable by mechanical means, the lost organ, and renders perfect speech possible just so far as it correctly substitutes the natural organs. No great or immediate improvement is observed, nor is it to be expected. From long practice, even in the youngest patients for whom it is advisable to operate, bad habits in attempting articulation have been formed, which have become almost permanent; these must be broken up, and, in a sense, the patient must begin anew to learn to talk. It will be readily seen, then, that the age of the

patient at the time of the operation has an important influence on the final success. In young persons, with sufficient sensitiveness to the defect to impel them to perseverance, and with such suggestions and instruction as may be of assistance, a few years may be expected to develop such improvements as shall entirely conceal the defect from the ordinary observer; and in some cases this has already been accomplished in a much less time.

"In persons more advanced in life, bad habits are more firmly fixed, and a longer time will be required, and it is not improbable that certain peculiarities might never be overcome. In all ordinary cases, a well adapted artificial velum presents to the eye of the physiologist as much perfection in its movements as it would seem possible to attain in a mechanical contrivance. It is capable of being raised, depressed, and contracted at will by the power of the muscle in the remnant of the natural velum; in short, performing, to all appearances, all the functions of the natural palate."

In conclusion, while there are some points which demand modification to bring the work up to the present improvements in theory and practice, taken as a whole, the well-established reputation of the author has been maintained in this edition. And if there is a work in our profession to which Sir John Herschell's definition of science—that it is "the knowledge of many, orderly and methodically digested and arranged so as to become attainable by one"—applies with peculiar force, it is the one under consideration; for matter of the most varied and heterogeneous character is presented by a master-hand in a manner which makes a perfect and homogeneous whole eminently attractive and instructive in its character. And this edition in particular, embodying as it does so many new features, should be in the library of every dental and medical practitioner. The typography and mechanical execution generally is in keeping with the excellent works issued by the publishers. The book can be obtained at Dr. S. S. White's depots in Philadelphia, New York, Boston, and Chicago. Price $5.

Transactions of the American Dental Association.—The Transactions of the American Dental Association for the year 1862, embracing also a report of the proceedings of the previous year, have been received. It is a matter of regret that a careful perusal of them has disclosed many typographical inaccuracies, which, in all probability, might have been prevented had due attention been given to the revision of the proof. Not only do they mar the appearance of the report, but the writers, whose printed articles contain errors not made by them, are placed in a peculiar light in the mind of the reader. The mistakes have doubtless occurred through the carelessness of the compositor; but had the proof-sheets been sent to the authors, the errors would hardly have escaped detection, and by this means, an avoidance, both of the incorrectness of the articles and the mortification of the writer, would have been secured. It is only necessary to direct attention to a few of the inaccuracies occur-

ring throughout the report: for instance, laticiferous, is spelled *laticaferous;* lacunæ, *locunæ;* carious, *curious;* Cuvier, *Cavier*, etc. There are others, but these are referred to as being among the most noticeable. In future it is to be hoped that the Committee on Publication will adopt such a course as will be most likely to secure the Transactions against the appearance of typographical errors. Writers are loathe to have the integrity of their articles marred by the occurrence, upon the printed page, of mistakes not made by them; and although the candid reader is apt to overlook a thing of the kind, when it occurs unfrequently, seeking more for the instruction which he may gain from a careful perusal of the subject-matter, yet there are others with intellects so contracted as to be never able to perceive merit, but are continually endeavoring to discover that which will enable them to give an unfavorable criticism.

With the utmost care, errors will sometimes find their way into print; but here they are of course unavoidable. It is best, however, to guard against such things, and, if possible, to prevent their occurrence.

These remarks are made not in the spirit of ungenerous criticism, but to guard against a repetition of these errors, and also in defense of writers whose productions have been inadvertently misprinted.

The report of the Transactions has appeared late, but the committee to whom the matter was entrusted had many difficulties with which to contend, and the delay in the publication was a necessity. Though small, the volume is highly interesting, particularly to the dentist. The articles are very good—especially that of Dr. Flagg, upon Arsenious Acid, embracing as it does many novel and instructive ideas. It is written in the author's usual clear and concise style, and will no doubt be read with interest by those who have received a copy of the Transactions. The Transactions can be obtained of the Committee of Publication. Price $1.

Parker on the Teeth. Birmingham: Cornish and Brothers, 37 New Street.—A small work of ninety-five pages, with the above title, intended for popular reading, has been received from the author. It is well written, and no doubt will be of service in the direction for which it was prepared.

The Atlantic Monthly—September, 1863.

The Tertiary Age and its Characteristic Animals.—Those readers of the Dental Cosmos, if there are any such, who have been so unfortunate or neglectful of their opportunities as not to subscribe to the *Atlantic Monthly*, have within the past two years missed a series of highly interesting and instructive articles on "Methods of Study in Natural History," and recently on Geology and Palæontology, from the pen of Professor Agassiz Prepared as these papers are for general reading, their

author has fully recognized and successfully effected what Humboldt truly and felicitously asserts in his Cosmos, viz.: "I take pleasure in persuading myself that scientific subjects may be treated of in language at once dignified, grave, and animated, and that those who are restricted within the circumscribed limits of ordinary life, and have long remained strangers to an intimate communion with nature, may thus have opened to them one of the richest sources of enjoyment, by which the mind is invigorated by the acquisition of new ideas. Communion with nature awakens within us perceptive faculties that had long lain dormant, and we thus comprehend at a glance the influence exercised by physical discoveries on the enlargement of the sphere of intellect, and perceive how a judicious application of mechanics, chemistry, and other sciences may be made conducive to national prosperity."

It is a great misfortune, as a general thing, that scientific subjects are treated of in such a dry and unattractive manner that works of this character are usually sealed volumes to all but those who by urgent necessity are compelled to wade through them. There is no excuse for this, and no reason why the road of science should be unnecessarily strewn with thorns; and those who, recognizing the importance of the general dissemination of scientific truths, succeed in presenting them in a manner which attracts the attention and instructs the general reader, render an incalculable service to the world.

On former occasions I have directed attention in this magazine to the *practical value* of such knowledge as that contained in the following extract, which is peculiarly instructive to the dentist on account of the prominent part which the jaws and teeth of some of the animals occupy in the discussion.

"It was an eventful day, not only for science, but for the world, when a Siberian fisherman chanced to observe a singular mound lying near the mouth of the River Lena, where it empties into the Arctic Ocean. During the warmer summer weather he noticed that, as the snow gradually melted, this mound assumed a more distinct and prominent outline, and at length, on one side of it, where the heat of the sun was greatest, a dark body became exposed, which, when completely uncovered, proved to be that of an immense elephant, in so perfect a state of preservation that the dogs and wolves were attracted to it by the smell of fresh meat, and came to feed upon it at night. The man knew little of the value of his discovery, but the story went abroad, and an Englishman traveling in Russia, being curious to verify it, visited the spot, and actually found the remains where they had been reported to lie, on the frozen shore of the Arctic Sea—strange burial-place enough for an animal never known to exist out of tropical climates. Little beside the skeleton was left, though parts of the skin remained covered with hair, showing how perfect must have been the condition of the body when first exposed. The tusks had been sold by the fisherman, but Mr. Adams succeeded in recovering them; and collecting all the bones, except those of one foot, which had been carried off by the wolves, he had them removed to St. Petersburg, where

the skeleton now stands in the Imperial Museum. The inhabitants of Siberia seem to be familiar with this animal, which they designate by the name of *Mammoth*, while naturalists call it *Elephas primigenius*. The circumstance that they abound in the frozen drift of the great northern plain of Asia, and are occasionally exposed in consequence of the wearing of the large rivers traversing Siberia, has led to the superstition among the Tongouses, that the Mammoths live under ground, and die whenever, on coming to the surface, the sunlight falls upon them.

"Had this been the only creature of the kind found so far from the countries to which elephants are now exclusively confined, it might have been believed that some strange accident had brought it to the spot where it was buried. But it was not long before similar remains were found in various parts of Europe—in Russia, in Germany, in Spain, and in Italy. The latter were readily accounted for by the theory that they must be the remains of the Carthaginian elephants brought over by the armies of Hannibal, while it was suggested that the others might have been swept from India by some great flood, and stranded where they were found. It was Cuvier, entitled by his intimate acquaintance with the anatomy of living animals to an authoritative opinion in such matters, who first dared to assert that these remains belonged to no elephant of our period. He rested this belief upon structural evidence, and insisted that an Indian elephant, brought upon the waves of a flood to Siberia, would be an Indian elephant still, while all these remains differed in structure from any species existing at present. This statement aroused research in every direction, and the number of fossil Mammalia found within the next few years, and proved by comparison to be different from any living species, soon demonstrated the truth of his conclusion.

"Shortly after the discovery of fossil elephants had opened this new path of investigation, some curious bones were found by some workmen in the quarries of Montmartre, near Paris, and brought to Cuvier for examination. Although few in number, and affording but very scanty *data* for such a decision, he at once pronounced them to be the remains of some extinct animal preceding the present geological age. Here, then, at his very door, as it were, was a settlement of that old creation in which he could pursue the inquiry, already become so important in its bearings. It was not long before other bones of the same kind were found, though nothing as yet approaching an entire skeleton. However, with such means as he had, Cuvier began a comparison with all the living Mammalia—with the human skeleton first, with Monkeys, with the larger Carnivora and Ruminants, then with all the smaller Mammalia, then with the Pachyderms; and here, for the first time, he began to find some resemblance. He satisfied himself that the animal must have belonged to the family of Pachyderms; and he then proceeded to analyze and compare all the living species, till he had collected ample evidence to show that the bones in question did not correspond with any species, and could not even be referred to any genus now in existence. At length there was discovered at Montmartre an upper jaw of the same animal—next a lower jaw, matching the upper one, and presently a whole head with a few back bones was brought to light. These were enough, with Cuvier's vast knowledge of animal structure, to give him a key to the whole skeleton. At about the same time, in the same locality, were found other bones and teeth also, differing from those first discovered, and yet equally unlike those of any living animal. The first evidently belonged to some stout and heavy

animal; the others were more slender and of lighter build. From these fragments, ample evidence to him of his results, he drew the outlines of two animals: one which he called the Palæotherium, (old animal,) and the other Anoplotherium, (animal without fangs.) He presented these figures with an explanatory memoir at the Academy, and announced them as belonging to some creation preceding the present, since no such animals had ever existed in our own geological period. Such a statement was a revelation to the scientific world: some looked upon it with suspicion and distrust; others, who knew more of comparative anatomy, hailed it as introducing a new era in science; but it was not till complete specimens were actually found of animals corresponding perfectly to those figured and described by Cuvier, and proving beyond a doubt their actual existence in ancient times, that all united in wonder and admiration at the result obtained by him with such scanty means.

"It would seem that the family of Pachyderms was largely represented among the early Mammalia; for, since Cuvier named these species, a number of closely allied forms have been found in deposits belonging to the same epoch. Of course the complete specimens are rare; but the fragments of such skeletons occur in abundance, showing that these old-world Pachyderms, resembling the Tapirs more than any other living representatives of the family, were very numerous in the lower Tertiaries.

"There is, however, one animal now in existence, forming one of those singular links before alluded to between the present and the past, of which I will say a few words here, though its relation is rather with a later group of Tertiary Pachyderms than with those described by Cuvier. On the coast of Florida there is an animal of very massive, clumsy build, long considered to be a Cetacean, but now recognized, by some naturalists at least, as belonging to the order of Pachyderms. In form it resembles the Cetaceans, though it has a fan-shaped tail instead of the broad flapper of the Whales. It inhabits fresh waters or shoal waters, and is not so exclusively aquatic as the oceanic Cetaceans. Its most striking feature is the form of the lower jaw, which is bent downward, with the front teeth hanging from it. This animal is called the Manatee, or Sea-Cow. There are three species known to naturalists—one in Tampa Bay, one in the Amazon, and one in Africa. In the Tertiary deposits of Germany there has been found an animal allied in some of its features to those described by Cuvier, but it has the crown of its teeth folded like the Tapir, while the lower jaw is turned down with a long tusk growing from it. This animal has been called the Dinotherium. Its hanging lower jaw, with the protruding tusk, corresponds perfectly to the formation of the lower jaw and teeth in the Manatee. Some resemblance of the Dinotherium to the Mastodon suggested a comparison with that animal as the next step in the investigation, when it was found that at the edge of the lower jaw of the latter there was a pit with a small projecting tooth, also corresponding exactly in its position to the tusk in the Dinotherium. The Elephant was now examined, and in him also a rudimentary tooth appeared in the lower jaw, not cut through, but placed in the same relation to the jaw and the other teeth as that of the Mastodon. It would seem, then, that the Manatee makes one in this series of Dinotherium, Mastodon, and Elephant, and represents the aquatic Pachyderms, occupying the same relation to the terrestrial Pachyderms as the Seals bear to the terrestrial Carnivora, and, like them, lowest in structure among their kind." * * * *

Referring to the recent discovery of fossil human bones, and the consequent inference of the high antiquity of man, Professor Agassiz remarks:—

"It would carry me too far, were I to attempt to give anything more than the most cursory sketch of the animals of the Tertiary age; and indeed they are so well known, and have been so fully represented in text-books, that I fear some of my readers may think even now that I have dwelt too long upon them. Monkeys were unquestionably introduced upon earth before the close of the Tertiaries; some bones have been found in Southern France, and also on Mount Pentelicus in Greece, in the later Tertiary deposits; but these remains have not yet been collected in sufficient number to establish much more than the fact of their presence in the animal creation at that time. I do not offer any opinion respecting the fossil human bones so much discussed recently, because the evidence is at present too scanty to admit of any decisive judgment concerning them. It becomes, however, daily more probable that facts will force us sooner or later to admit that the creation of man lies far beyond any period yet assigned to it, and that a succession of human races, as of animals, have followed one another upon the earth. It may be the inestimable privilege of our young naturalists to solve this great problem, but the older men of our generation must be content to renounce this hope; we may have some prophetic vision of its fulfillment, we may look from afar into the land of promise, but we shall not enter in and possess it."

PERISCOPE OF MEDICAL AND GENERAL SCIENCE IN THEIR RELATIONS TO DENTISTRY.

BY GEO. J. ZIEGLER, M.D.

"*Diathesis.* By Dr. Anderson, of Illinois. Being a paper read at the last meeting of the American Medical Association held at Chicago.— The term diathesis is used to express any general constitutional condition which exerts modifying influences upon the course of disease.

"These conditions produce very powerful and controlling effects upon the results of surgical injuries and operations, and to one of them alone, viz., the aplastic diathesis, ten per cent. of the deaths in surgical cases are due. This mortality is capable of being entirely prevented by means now within our knowledge and control. Yet the subject is difficult, and, being incapable of the attractions of pictorial illustration, is liable to be overlooked by superficial observers.

"A great variety of diatheses exist, each having its own peculiar character; but the two which have the most important surgical relations are the *aplastic* and the *hyperplastic.*

"The *aplastic diathesis* is that condition of the system in which there is an excessive tendency to a dissolved condition of all protein compounds, the blood corpuscles breaking down, the solid tissues readily ulcerating, and all the products of inflammation taking a liquid form, being either degenerated blood, serum, or pus. At the same time, there is a more or less striking absence of the power of depositing plastic lymph around inflamed points. It is in this diathesis alone that the patient becomes capable of those fatal aplastic diseases—traumatic erysipelas, diffusive phlebitis, pyæmia, and hospital gangrene. The deaths from these causes, amount-

ing to ten per cent. of all mortality after surgical operations, may all be prevented.

"The causes of the aplastic diathesis probably operate by inducing an excessively alkaline condition of the system. Alkalies are the natural solvents which in the human body maintain the liquid form of certain protein compounds, such as fibrin, albumen, caseine, etc., whether found in the blood, pus, or serum. It is probable, therefore, that an excess of these alkalies would have the effect to keep these compounds in the liquid form to an excessive extent. All the products of aplastic inflammation and effusion, whether blood, serum, or pus, are alkaline. Besides, the effluviæ of decomposing animal secretions, which are the most powerful external causes of aplasticity, are all saturated with alkaline gases of the ammoniacal series.

"As was just remarked, the most powerful external cause of the aplastic diathesis is the exposure of the patient to the depressing alkaline effluviæ from decomposing pus, urine, or other animal products.

"I saw this repeatedly exemplified during my service in the army. The crowding of too many wounded men into hospitals always produced within three days the evidences of aplasticity. Of two hospital steamers, after a battle near Vicksburg, where one was overcrowded and the other was not, the mortality on board the one not crowded was five per cent., and on the other, thirteen and a half per cent.; the excess being due to erysipelas, pyæmia, and secondary hæmorrhages. So striking are these results that it is easy by the sixth day to distinguish the men who have lain in an overcrowded ward, simply by the appearance of the wounds. A thousand men of this sort, mixed with a thousand others who have been kept in perfectly pure air, could readily be separated by inspection of the wounds alone.

"The effect of the aplastic diathesis is to prevent all that effusion of plastic lymph necessary to the repair of injured tissues, and to drain away the nutritive material of the blood in an excessive flow of pus or serum, thus exhausting the patient. In this diathesis incised wounds do not readily unite by first intention; lacerated wounds do not granulate freely; ulcerations become phagedænic; injured vessels reopen after ligature, and sound ones give way to ulceration, producing secondary hæmorrhage; and most important of all, the irritant animal poison found in erysipelas and hospital gangrene, when formed or received in any part of the body, spreads and produces rapidly fatal results, because its action is not limited by any barrier of plastic lymph.

"The relation of this important poison to the aplastic diathesis is as follows: The poison may be inoculated into a plastic constitution, but it will not there produce either erysipelas or hospital gangrene. The irritated spot is immediately surrounded by plastic lymph, a local abscess ensues, and the poison is expelled with the pus. A plastic constitution cannot have erysipelas; but an aplastic one is liable to all the mischiefs resulting from diffusion of the poison in a liquid form through all parts of the body. I suppose that the suppurative inflammation of the internal coats of the veins results from the poisonous lymph taken up by the lymphatics at the affected part being carried into the venous current. Hence pyæmia.

"The aplastic diathesis may exist without the poison, and the poison may be present without the diathesis; but when both are present, a fatal result is to be feared. Both the aplastic diathesis and the existence of

the erysipelatous poison may be epidemic. The presence of these conditions produces a malignant character in the prevailing distemper. At such times malignant scarlet fever, hospital gangrene, puerperal peritonitis, confluent smallpox, and all other malignant local inflammations are found to contain the erysipelatous poison, and are capable by inoculation or contagion of propagating erysipelas in aplastic, and abscesses in plastic constitutions.

"The aplastic diathesis can be diagnosed in advance of a surgical operation, so as to enable the practitioner to guard against its effects. This may be done by carefully studying the condition of any abrasions, pimples, scratches, etc., some of which may be found upon the skin of almost every patient, or at any rate may be made in important cases for the purpose of diagnosis. They show the effects of the diathesis in the same manner as larger injuries.

"The treatment of the aplastic diathesis consists—First, in securing a perfectly fresh and pure air for respiration; second, the administration of such remedies internally and externally as will neutralize the alkalies. Such are the tincture of iron, iodine, chloride of zinc, sulphate of iron, bromines, sulphuric, muriatic, and nitric acids, etc. Chlorine, iodine, and bromine not only neutralize alkalies, but destroy animal poisons. Practically, I use mur. tinct. of iron in doses of twenty drops internally every one or two hours, and tincture of iodine with glycerin kept constantly upon any local manifestation of the poison.

"By the free use of the tincture of iron the diathesis may be changed from aplastic to plastic in thirty hours, and a marked improvement be manifested in the parts affected. For the past five years I have made a constant practice of giving muriated tinct. of iron as a prophylactic after surgical operations, always commencing its administration in a few hours without waiting for any actual manifestation of aplastic diseases. Since I have commenced this precaution, no patient of mine has ever died of traumatic erysipelas, phlebitis, or pyæmia, and yet I have operated in a vast number of cases, and ought, under the ordinary management, to have lost a number of patients by these complications. Erysipelas under this prophylactic treatment sometimes makes an effort to commence, but is readily conquered without dangerous results. I now feel perfectly safe in this respect, *and have ceased to reckon erysipelas, phlebitis, or pyæmia, among the risks of my operations*, if I have control of the patient.

"The *normal diathesis* is that where neither plasticity nor aplasticity is in excess, but where the medium happily prevails.

"The *hyperplastic diathesis* is the opposite extreme from the aplastic. It is probably caused, as claimed by Fuller in his work on rheumatism, by the excess of acids in the system. It is marked by an excessive tendency to solid deposits in inflammation. Suppuration is difficult, and, when it occurs, is surrounded by a hard plastic tumor. Wounds unite readily by first intention, but contusions and sprains form hard swellings, which are slow to suppurate, slow to resolve, and often keep the patient lamed for a year after the injury. Erysipelas, diffuse phlebitis, and pyæmia are impossible, unless this diathesis is first overcome; but the inoculation of the erysipelatous poison results only in the formation of local inflamed tumors, which occasionally suppurate and discharge from the summit of a hard, well-defined swelling. Very painful felons occasionally result if the poison is applied to the hands.

"The signs of this diathesis are—1st. Any symptoms of genuine rheumatic tendencies—rheumatism being the typical disease of the hyperplastic diathesis as much as erysipelas is of the aplastic. 2d. Rapid drying up of scratches, abrasions, pimples, etc. upon the skin, without any tendency to suppuration. 3d. Absence of all disposition to pustular eruptions, the skin being clear, and often a little coarse, dry, and firm in its appearance. If there are any eruptions, they are apt to be of the scaly varieties, showing a tendency to excessive development of the cuticle.

"I pass over the consideration of the cancerous, tuberculous, and syphilitic cachexies, for want of time at the present, designing to return to the topic at a future meeting."—(*Amer. Med. Times.*)

"*Allotropy.* By W. B. Tegetmeier.—The singular phenomena which are known to chemists under the title of allotropy are so remarkable, and can be so easily illustrated by means of a few simple experiments, capable of being performed without any particular apparatus, that they may advantageously form the subject of one of the series of practical papers that were commenced in a former volume of the *Intellectual Observer.*

"The term allotropy is employed to signify the remarkable circumstance, that the same substance can exist in two or more totally different states, which are distinguished from each other by extraordinary variations both in their physical and chemical properties. The same substance, for instance, may be in one state fearfully poisonous, in another perfectly harmless. In one condition it may be brittle, in another extremely elastic. Again, it may have a liquid and several solid states, being in one vitreous or glassy, in another crystalline, and in a third perfectly amorphous. These singular changes of condition are the more remarkable from the fact that any one may be produced at the will of the operator, each particular state being readily convertible into either of the others.

"The most familiar examples of allotropic substances are the elements carbon, phosphorus, and sulphur. Of these the latter is most easily experimented upon, and as some new facts relating to its allotropic conditions have recently come to light, we will select it for illustrating this peculiar class of phenomena.

"Common commercial sulphur, or that found native in several parts of the earth, is soluble in turpentine in most of the mineral oils, as benzine, and also in bisulphide of carbon; when crystallized, it exists in the form of elongated octohedrons. If a few pounds of the common sulphur be melted in a crucible and allowed to cool slowly until a crust forms on the surface, (when the crust should be broken and the liquid exterior poured out,) the sides of the cavity will be found to be lined with transparent yellowish needle-like crystals, having a totally distinct form from the octohedral variety, being in long oblique prisms. These crystals spontaneously change in the course of a few days, and pass again into the first-named more opaque octohedral form, the crystals retaining their outward shape, but in reality being constructed of an aggregation of minute octohedrons.

"This change from the transparent prismatic to the opaque octohedral form is one of great importance in the plastic arts. Sulphur, when melted at a low temperature, and first cast, possesses a considerable degree of transparency, and a fair amount of tenacity and freedom from brittleness. It can be readily cut or trimmed with a knife, having very much the consistence of a hard horny cheese. Advantage is taken of this by the

makers of plaster medallions and the copiers of old coins and medals. They moisten a plaster medallion, or grease slightly the surface of a medal, and then, securing a paper rim around it, pour on melted sulphur. This solidifies into the transparent prismatic variety, and may be cut and trimmed into shape, serving as a mould in which new plaster copies may be cast. After a few days, however, the sulphur resumes its octohedral brittle form, and the attempt to use it as a mould when in this condition generally results in its being defaced in consequence of its extreme brittleness.

"Other peculiar allotropic forms of sulphur are produced by melting it at different temperatures.

"When heated to a degree not exceeding 120° Cent., sulphur forms an exceedingly limpid mobile liquid, that possesses the property of taking sharper casts than any other substance; hence its employment as previously mentioned.

"If it is heated to a higher temperature, it becomes gradually darker and extremely thick and viscid, so that the flask in which it is being melted may be inverted without its running out. The greatest degree of thickness and viscidity is attained at a heat of about 250° Cent. If it be heated to a higher degree, it becomes more liquid again, though never to the same extent as when at a lower temperature. If in this highly heated state it is poured in a thin stream into water, sulphur assumes the extraordinary form of a rich amber brown transparent substance, possessed of a very high degree of elasticity, and capable of being drawn out into threads. In this extraordinary condition it is quite insoluble in bisulphide of carbon and other menstrua that so freely dissolve octohedral or common sulphur.

"In the course of a few hours, however, it returns to the common brittle condition, the change being accompanied by the evolution of heat, and, what is very remarkable, this change may be instantly brought about by placing the elastic sulphur in boiling water.

"In the elastic state, sulphur is evidently in the vitreous or glassy form. This form is dependent on the fact that the sulphur has united with a proportion of heat, which has become latent in effecting this change.

"A very good illustration of the vitreous condition assumed by some allotropic substances exists in barley sugar. This is formed by boiling sugar with the smallest possible quantity of water capable of dissolving it when aided by heat; as thus formed it is, while heated, a soft vitreous substance, capable of being twisted in spiral sticks, or formed into any required shape.

"The proof that this peculiar condition is owing to latent heat is very convincing. If a mass of moderately warm barley sugar be taken and pulled out to double or treble its length, then folded and pulled out again and again, it eventually loses its transparency, becoming converted into penides, or pulled sugar, as it is technically called. But to pass from the vitreous condition it must get rid of its latent heat, and therefore, as the change is accomplished, the whole mass throws out this hidden caloric, becoming so hot that the hand cannot hold it.

"To return, however, to the elastic state of sulphur: this condition may be rendered much more permanent by the addition of the minutest portion of iodine to the sulphur while melting. The smallest particle of iodine renders the limpid melted sulphur of a dark color, and seems to be

retained in spite of the high temperature to which it is necessary to raise the sulphur previous to pouring it into water. This iodized sulphur is much more elastic than that which has been fused and cooled without the iodine.

"By many chemical authors this elastic sulphur is called *plastic* sulphur, an absurd misnomer, inasmuch as plastic signifies that which can be moulded into any required form, certainly not a property of elastic sulphur; and, misled by this absurd title, one of the best known writers on chemistry states that it is in this condition that sulphur is used for taking casts!

"These changes, though not all of which sulphur is capable, serve very well to show the remarkable allotropic changes of which many substances are susceptible. That the same body should, without any alteration of its composition, be able to exist in the apparently opposite states of extreme brittleness and high elasticity, of transparency and opacity, of solubility and insolubility, in octohedral and in prismatic crystals, in a state of extreme limpidity and in one of great viscidity, is a very remarkable circumstance, and one worthy of being investigated with much greater care than it has yet received."—(*Intellectual Observer.*)

"*Formula for a New Transparent Carmine Injection.* By T. A. Carter, M.D., Physician to the Warwick Dispensary, Leamington.—In Dr. Beale's work on 'The Microscope in Clinical Medicine,' it is stated that Mr. Smee has produced very successful injections of the capillaries of the brain with an ammoniacal solution of carmine. Having occasion to use a colored transparent injection some time ago, I made trial of this solution, to which I added a certain amount of gelatine. In my hands, however, it failed most signally; the coloring matter passed through the coats of the blood-vessels, and stained the surrounding tissues in such a manner that the capillaries could not be distinguished. Having made repeated experiments with this fluid on various organs, and having as repeatedly failed, I came to the conclusion that a satisfactory result was of too rare occurrence, and depended too much upon the physical and chemical condition of the tissues, to induce me to expend more time and material in such fruitless endeavors. Reflecting on the acid nature of carmine, and its sparing solubility in water, it occurred to me that, if it were precipitated from its solution in ammonia by an acid, it might be obtained in a state of division sufficiently minute for penetrating the capillaries, and that in such state it would not be liable to color the blood-vessels and surrounding parts. I accordingly dissolved a little carmine in dilute caustic ammonia, and added to the solution, drop by drop, some weak acetic acid, until precipitation ceased. On placing the precipitate under the microscope, however, it appeared to me that the flocculi were much too large to traverse the finest capillary vessels. I did not, therefore, proceed further with this experiment, but determined on trying the effect of throwing down the pigment in the solution of gelatine, as I imagined that by so doing the aggregation of particles might be prevented. This surmise proved to be correct; for, on examining the injection so prepared, it appeared to be perfectly homogeneous, and without the faintest trace of granularity. It was, moreover, found to run freely through the blood-vessels without tinting the tissues in contact with them.

"The following is the formula which I have found from ample experience to yield the most satisfactory results: pure carmine, ʒj; liq. ammon. fort. (P.L.), ʒij; glacial acetic acid, (50° Fr.), ʒj. M. xxvj; solution of gelatine, (1 to 6 water,) ℥ij; water, ℥iss. Dissolve the carmine in the solution of ammonia and water, and filter, if necessary. To this add ℥iss of the hot solution of gelatine, and mix thoroughly. With the remaining ℥ss of gelatine solution mix the acetic acid, and then drop this, little by little, into the solution of carmine, stirring briskly during the whole time.

"If properly prepared, this injection will, I believe, be found to be the most penetrating one that has yet been introduced. With it I have succeeded in filling the capillaries of the brain, spinal cord, eye, tongue, periosteum and bone of the mouse; the lungs, liver, pancreas, kidneys, and other organs of various domestic animals. Tissues injected with this fluid may be mounted either in Canada balsam, weak spirit, acidulated glycerin, or other preservative fluid, which will not dissolve or act injuriously upon the carmine or gelatine."—(*Archives of Medicine* and *Dub. Med. Press.*)

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"*Use of Ether in Surgical Operations.*—DR. T. D. LENTE, surgeon to the West Point Foundery, publishes, in the *American Medical Times*, a tabular statement of thirty-three surgical operations performed by him with the use of sulphuric ether as an anæsthetic. These cases are furnished to show the fallacy of the objection urged against the use of ether by the advocates of chloroform on account of the *length of time* and the *large quantity* requisite when the former is used. Some of these operations were among the gravest in surgery, such as the amputation of the thigh and arm, and the removal of large tumors; a number of teeth were extracted—from six to fourteen having been removed during the etherization; the time required, however, in no case exceeded 6½ minutes, ranging from that time to 1½ minute. The quantity varied from 1½ drachm to 16 drachms. The inhaler used by Dr. L. is made of coarse and stiff towels, folded in the shape of a cone, and a handkerchief or soft cloth, on which the ether is poured, is thrust into the apex of the cone."—(*Boston Med. and Surg. Journal.*)

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"*Dropsy of the Antrum from Malposition of a Tooth.*—DR. HODGES exhibited to the Boston Society for Medical Improvement a permanent incisor tooth, removed from the posterior wall of the cavity of the antrum. A little boy, ten years old, presented himself among the out patients of the hospital, with a deformity of the left side of the face, which, on examination, proved to be due to 'dropsy of the antrum.' The anterior surface of the superior maxillary bone was absorbed and distended, presenting the parchment-like crackling and feel characteristic of this disease. The operation practiced for its relief consisted in the removal of an elliptical-shaped piece from the wall of the cavity, just above the alveolar border of the bone, close to the reflection of the mucous membrane from the gum to the lip. A large quantity of viscous, transparent fluid was discharged. On inspecting the cavity of the antrum, the tooth shown was seen lying flatwise on its posterior wall, from whence, with some difficulty, owing to its offering so little surface to be seized, and its firm implantation, it was extracted. The boy made

a rapid recovery, and his face resumed its natural contour. The specimen was thought worth exhibiting, as this malposition of a tooth is recognized as in rare instances causing an encysted condition of the antrum; two cases of the disease, one by A. Dubois and the other by Blasius, being recorded as having originated from teeth developed in a similar abnormal situation."—(*Ibid.*)

"*The Physiology of the Nerves of the Tongue.*—MESSRS. PHILIPPEAUX and VULPIAN, very industrious French experimental physiologists, have been engaged of late in testing the properties of the three nerves supplying the tongue. By experiments upon dogs they have found (as stated in a paper sent to the Academy of Sciences) that by destroying, for a certain time, the physiological properties of the glosso-pharyngeal nerve, (which, according to the authors, is the *motor* nerve of the tongue,) the lingual nerve (which the authors consider to be the sensitive nerve of the tongue) acquires motor properties which it did not possess before. Messrs. Philippeaux and Vulpian mean to extend their experiments; but it seems proved by those above mentioned, that when the glosso-pharyngeal nerve is severed from its connection with the nervous centres, a modification occurs in the peripheral extremities of the lingual nerve of the same side, establishing between these extremities and the muscular fibres of the tongue a physiological relation which had not before existed."—(*Lancet.*)

"*On Infantile Paralysis.* By HOLMES COOTE, ESQ., F.R.C.S.—The description of the disease termed 'infantile paralysis' is, I think, generally defective in two particulars: first, it is regarded as a morbid affection standing somewhat apart from other diseases of the nervous system; secondly, the description does not include those final and secondary changes in the muscular and osseous systems which produce contractions of limbs, deformities, or even complete loss of power.

"The Orthopædic Hospital affords a very ample field for the investigation of this subject, about 80 of every 1000 patients being instances of the affection in some one of its varied forms; and I must here state that the cases which come under treatment appear to me to be the survivors of a yet larger number, many of whom have perished from the violence of the symptoms at the first attack. I cannot, therefore, look upon it as a 'disease not dangerous to life;' although it is true that many patients survive, bearing upon them, nevertheless, in their withered and contracted limbs, the traces of the severity of the shock they have sustained.

"In speaking of this class of nervous affections, I must limit the term of 'infantile paralysis' to one of the effects produced by the functional disturbance of the nervous centres; for, as must hereafter be shown, muscular atrophy and general loss of temperature and power express, in a very rough way, the complications with which we have to deal. Atrophy may be limited to one muscle, or to a set of muscles; there may be contraction of a limb either with or without atrophy; the direction of the contraction varies extremely.

"Respecting the condition of the brain and spinal cord, I need scarcely observe that the absence of any recognized morbid change of structure in those cases in which we have the opportunity of making a post-mortem examination is rather to be regarded as an instance of our defective means

of observation than as a proof that no such morbid change exists. Of the truth of this statement, tetanus offers a well-known proof. Morbid anatomy has hitherto revealed nothing satisfactory to explain the phenomena which occur during life. The same remark applies in general to cases of infantile paralysis. But in one case a deposit of tuberculous matter was found in the membranes of the brain about the cerebellum; and in another, an impacted calculus seemed the cause of the disturbance by its reflex irritation. The most common exciting cause is the irritation of first dentition; but I have known the same effect to be produced by the second dentition, and have witnessed symptoms of analogous character, though not so strongly marked, in the adult. A young lady, twenty-two years of age, whose teeth were crowded together and partly decayed, experienced occasional attacks of numbness and loss of power in one upper extremity, recurring at intervals, until she had been relieved by an experienced dentist of the stumps of a number of decayed teeth which had been the source of pain. But the attack may be quite sudden, without any recognized premonitory symptoms. Thus an infant at the breast will appear to have momentary faintness, or may be taken up by the nurse as usual after an apparently uninterrupted night's rest, and in both instances the limbs may be found paralyzed."—(*Ibid.*)

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"*Removal of a Necrosed Lower Maxilla, with Preservation of the Periosteum and the Reproduction of New Bone.*—M. Rizzoli, of Bologna, has submitted to the Surgical Society of Paris a case of necrosis of the lower jaw, from the fumes of phosphorus, in a man, aged fifty-six years, in which the sequestra were removed through the mouth. M. Rizzoli made incisions on either side of the gums, scraped the thickened periosteum with a spatula from the dead bone, and removed the latter piecemeal. The preserved periosteum generated new bone in the place of the portions taken away, which comprised the body and part of the ramus on each side. It was, however, soon found that the upper part of the ramus and the condyle were also diseased; these portions of bone were also removed through the mouth with the same precautions, and the periosteum again acted in the same way. Eventually the man was able to use his jaw and masticate, though deprived of teeth. M. Forget, who reported on the case, observed very justly that there was nothing new in this action of the periosteum in necrosis of bone, surgeons having long acted upon this periosteal property in such cases. M. Flourens had pointedly said: 'Take away the bone, preserve the periosteum, and the preserved periosteum will restore the bone;' but this applies less to cases of necrosis of bone than to cases of experiments on animals and operations performed on healthy bone and periosteum. And even in these cases, it should be remembered that osseous substance is reproduced; but not the actual bone as it existed before the resection."—(*Ibid.*)

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"*Nitrite of Amyle.*—Dr. Richardson made a communication to the British Assoc. for the Adv. of Science on the physiological properties of this agent, a specimen of which he placed on the table. He stated that the substance when inhaled increases the action of the heart, produces flushing, heat of the face, and constriction of the forehead. He then dwelt on the smallness of the dose that was necessary to produce these results,

and proceeded to consider the action of the nitrite on inferior animals, especially on frogs, upon which animals it exerts the property of suspending animation for periods of eight and even of nine days. The subject excited considerable interest."—(*Ibid.*)

Ophthalmia from Sulphur.—The Paris correspondent of the *Lancet* states that the "vine-laborers in the south of France having for some time been suffering from a peculiar form of ophthalmia, differing in some respects from those forms with which we are familiar, the medical men of those districts have been able to trace the evil to the employment of sulphur for the prevention of vine-disease."

"*Almost Complete Union of the Free Border of the Velum Palati Mollis with the Back of the Pharynx.* Under the care of MR. HULKE, London Hospital.—A maid-of-all-work, aged twenty-two, was brought to the out-patients' room August 6, 1862, to know if her vision, which was impaired by a corneal cicatrix, could be improved. Her peculiar nasal voice drew attention to her throat. The whole free border of the velum was connected with the back of the pharynx, excepting in the situation of the uvula, which had disappeared, where there was a small hole through which a probe could be passed upward.

"Her dwarfed stature, flattened features, widely-set and peg-like teeth pointed to inherited syphilis. Her mother had had several miscarriages before giving birth to this living child. In infancy she had a sore mouth, and at four years old ulcerated sore throat."—(*Med. Times and Gaz.*)

"*Congenital Ranula.*—There are only two instances of this affection on record, one published by M. Paul Dubois in 1833, and a second recently communicated to the Toulouse Society by M. Lombard. M. Dubois was called to his case when the child was two days old. It was able to swallow fluids presented by a spoon, but could not suck. The sac, in size and form resembling a large nut, was punctured, and after its glairy contents were discharged, the child sucked for the first time. No reproduction of the fluid took place during the three weeks the child was under observation. The ranula differed from that usually observed, inasmuch that the sac was not attached to the floor of the mouth, but placed in front of the frænum, within the substance of the free anterior portion of the tongue, of which it seemed to form part. M. Lombard saw his case three hours after the infant's birth, a tumor the size of an egg protruding through the lips, the frænum giving it a bilobular form. The tip of the tongue was projected toward the arch of the palate, while its body was parted backward by the tumor, which was perceptible below the jaw. The child's life being in imminent danger by the obstruction of respiration, the tumor was pierced by a trocar, and a seton introduced in the canula. The fluid was glairy and abundant; but, even after it was all discharged, the membranes of the cyst were sufficiently voluminous to retain the tongue in its abnormal position and prevent sucking. Four days after a portion of the cyst was excised, considerable hæmorrhage resulting. Suppuration was set up, and the cyst gradually diminished in size, the seton being removed on the seventeenth day. By that time the child was able to suck well. Four months afterward, the child was found quite well, the tongue having recovered its natural position."—(*Bull. de Thérapeutique* and *Med. Times and Gazette.*)

"*Magnesium.*—Mr. Sonstadt has recently patented a process by means of which he prepares the metal magnesium, the base of the earth magnesia. The process adopted is a great improvement on that of Deville, inasmuch as it enables the magnesium to be obtained commercially and in quantity, the practical difficulties which hitherto restricted the manufacture being obviated. Magnesium as thus obtained promises to effect as great a revolution in some of the arts as aluminium has done, inasmuch as its properties are very remarkable, and its alloys, hitherto unworked, hold out high promise of rich reward to those who investigate their properties. Magnesium in its pure state is a very light metal, being considerably less than twice the specific gravity of water; it is, in fact, the lightest known metal that can remain in contact with air or water without rapid oxidation. Magnesium has a fine, white, silvery lustre; it is malleable and ductile to a considerable extent. A fine wire of the metal, heated in the flame of a candle, takes fire, and burns with an intense white light of such brilliancy that the various shades of color are shown with the same distinctness as by the direct light of the sun.

"Mr. Sonstadt's process, by which this metal is prepared on a manufacturing scale, may be briefly described as follows: A mixed solution of the chlorides of magnesum and sodium is evaporated to dryness, and then heated to redness; the fused mass remaining is then decomposed by being heated with metallic sodium in close iron vessels, from which the air is excluded, the use of clay crucibles and chloride of ammonium being especially avoided. Large masses of the metal made by this process have been exhibited at several of the scientific meetings during the last few weeks."—(*Chemist and Druggist.*)

Aluminium Bronze Instruments.—"M. Morel-Lavallée has recently made a very favorable report to the Paris Society of Surgery upon a pocket-case of instruments, fabricated by MM. Robert and Collin, of aluminium and bronze, the alloy varying from 5 to 10 per cent. of aluminium. All the instruments, except the blades, are made of this; and they may advantageously replace the much dearer silver in many cases; and in others, iron, or even steel. The metal is not oxidizable, and preserves all its brightness amid the various agents it is brought into contact with in daily practice."—(*Ibid.*)

Silicates.—In an interesting paper on the manufacture of iron and steel, read before the *Franklin Institute*, and published in its journal, Prof. Fleury makes the following statement respecting the influence of lime in decomposing these salts: "*Unslacked burnt lime possesses the peculiar property of decomposing silicates during hydration, or slacking*, as it is commonly called. This can easily be demonstrated by pouring water slowly into an intimate mixture of sand and freshly burnt lime; the outside of the sand grains will yield to the lime gelatinous silica, and when dried, form with it a strong chemical combination—silicate of lime —the base of a good mortar."

To make Paper adhere to Tin.—The *Sci. Amer.* says that neither paste, gum, wax, nor glue will make paper adhere to tin, unless the surface is well rubbed with acetic acid or strong vinegar. Many other acids will answer, but vinegar is always cheapest and most convenient.

THE

DENTAL COSMOS.

NEW SERIES.

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ORIGINAL COMMUNICATIONS.

PRACTICAL HINTS.

BY J. D. WHITE.

Diagnosis of Toothache.—This subject was referred to in the October number of the Dental Cosmos, with a promise to furnish a history of additional cases. There is a pathology for every case—there can be no doubt of that; and when two cases or more of toothache are found to differ, it is the duty of the dentist first to decide in what they differ, so as to account for the pain on proper principles; for instance, Case 1 will illustrate: A lady, perhaps twenty years of age, called to consult a dentist in a neighboring town, when on a visit there. She was suffering great pain in the right side, upper jaw, the second bicuspid tooth was broken off, the periosteum highly inflamed; some pus formed, the dentist lanced for it; the first molar was much decayed, and intensely painful. This latter tooth was advised to be extracted to relieve the pain; the patient desired it to be plugged, but the dentist said it could not be, as the nerve was exposed, and it could not be treated, and would do nothing to the case. The patient called to consult us; we found that the nerve was not exposed; we applied creosote on cotton one day to help get rid of some loose gum dropping into the lower boundary of the cavity, and to reduce the sensibility of the bone, when we were enabled to remove the decay, and plug the tooth without much suffering; the inflammation about the root of the bicuspid root subsided, and the patient has been perfectly comfortable since. This was more carelessness of the dentist perhaps than ignorance, but it was his business to determine the condition of the molar, in order to push the origin of the pain to some given point, as in this case it originated in the root of the bicuspid tooth. Pathological

signs in this case were the only thing on which we could rely, and not the feelings of the patient.

Case 2.—Mr. M., a gentleman thirty years of age, called to consult us in great suffering; he was a very nervous and impressible temperament. The pain was referred to the lower first molar, left side, which we had plugged three years ago; he said the pain was most severe at night. By a glance at the tooth, we saw that the plug was sound, and the tooth and gum looked healthy. We remarked to him, I will write the history of your case before I look further. There is no use, he replied. Doctor, I know where the pain is, that is all right as far as you have to do with it, but it will not do for me. We separated between the second superior bicuspid and first molar, as we could discern some whiteness between them, and greatly against the patient's wish, and on excavating the molar found the decay to reach the nerve; we placed some paste into the cavity; there was no further pain, as the nerve was destroyed before night. When the patient called the next morning he remarked, I believe you are right, as I had no pain last night. Severe pain at night is always a sign of an inflamed nerve; owing to what is known as the febrile exacerbation of the evening, it may be more or less severe during the day, characterized by soreness of the tooth to the touch, etc.

Case 3.—A Mr. B., aged forty years, sanguine lymphatic temperament, called to consult us about a severe pain in the right upper jaw, of long standing; the first symptoms were undefined; occasional pain darting through the whole jaw and temple, it finally settled in the teeth of the upper jaw, but the patient could not decide from which tooth it originated. We found, on examination, that the teeth were all sound but the second molar, it had a small plug in it on the crown surface; had been plugged about twelve years. We suspected that the pain originated from that tooth; we drilled out the plug, which seemed to have been well put in, but the dentine below it being soft and dry, it cut away like packed ashes; this condition of the dentine, about an eighth of an inch, reached to the nerve. We applied the paste; saw the case next day, and found the pulp partially dead, but the patient had experienced no more pain; in due time the pulp was entirely destroyed, and, when the bleeding subsided, the tooth was plugged; and up to this time, six months, no further pain has been experienced. It is not likely that the dentine was dead or softened at the time the tooth was plugged, twelve years ago, but it had undergone deterioration until this deteriorated dentine reached the pulp, and, becoming a foreign body, acted as such to inflame the nerve. The symptoms were at first obscure, because the morbid impression on the pulp was not violent.

(To be continued.)

CAUSES RETARDING DENTAL PROGRESS.

BY WM. H. ATKINSON, M.D.

Read before the American Dental Convention, Saratoga Springs, Aug. 1863.

DENTAL progress, like all other forms of reformatory or advancing movement, is retarded by all the causes and any causes that lay the foundation for its necessity. In general terms, we may safely aver that *ignorance* of and failure to obey *law* is the prime cause for the necessity of dental science, so far as it pertains to practical results to be attained by the teaching and practice of dental science and manipulative art. There is a striking resemblance between complete states of ignorance (or lack of knowledge) and knowledge in all the practical applications of the purposes of the mind. The old homely phrase, "he who *knows* nothing *fears* nothing," might as truly be coupled with "he who *knows* all things is superior to all influences of *doubt*, and is therefore above *fear* of every variety."

It is the nature of mind spontaneously to essay to execute its purposes; and hence it acts upon the supposition that it is omnipotent until by failure it discovers the limit of its *present* effective range. It is only the timid, half-made-up sort of mind that instinctively entertains a doubt of accomplishing the spontaneity of its desires and deigns to debate probabilities. The confident, well-made-up sort of sentient nature will scarcely entertain a doubt of its ability to perform its behests in the face of many failures to effect that end. Not having "calculated the chances," as ripe experience has taught the mutilated and fatigued specimens of this sort of mind to do in subsequent pioneerings, it is difficult for them to accept the unpleasant truth that it requires time and repeated effort to enable them to practicalize the purpose that is so easily and clearly formed without conscious effort on their part. The will to do is present; but how to perform they find not at once.

Just in the degree that we become masters theoretically and accomplished workmen practically will we be confident of success in our efforts to accomplish that which we undertake. But if we should miscalculate the principles of the case, or our skill to perform the work of redemption, failure will open our vision to see our lack of knowledge or command of our powers, and thus we are prepared for intelligent efforts at further attempts to accomplish the work, having learned the way by which it cannot be done. The failure having resulted from a stretching too far beyond the measure of power of diagnosis or performance, should not discourage us from further attempt to accomplish new and untried feats. But it should admonish us to look well to the principles involved in every case, new or trite, that we may keep within due bounds, and progress in steps where tropes would too distantly connect the ideal and the practical.

Short pupilage implies imperfect instruction, and imperfect instruction lays the foundation of all failures to accomplish desirable results. Does

any deny this, and point to many of those in the first ranks of our honorable body, and promise that they were either pupils for very limited terms, or actually never acknowledged any one as tutor at all? My reply is, that this does not militate against the position assumed. For the closest scrutiny will prove that undying effort, study, and labor has had much more to do with the making of accomplished dentists than the most brilliant genius.

To be sure, the pupilage and preparation may not have been attained in any dental office or school especially devoted to that science; but the education of the eye, hand, head and heart must have been attained *before* the performance of any superior work pertaining to any department of dental art.

But all the brilliant success of this class of our members will not warrant us in assuming that genius and not tutorage and pupilage is the prerequisite for a useful and successful dentist. Take the testimony of the whole career of any one who has been eminently successful, and my word for it he was a working man, and also had suffered immensely from failures to realize in practical results the good desires which prompted him to enter an untrodden field for the good to be accomplished. Those who stand highest among us are indebted to a medical education in the schools of anatomy, chemistry, and therapeutics, etc., or to a long line of inflictions of needless misery, suffering, and loss of teeth and comfort to numerous patients, by which they have been educated up to their present ability. And who in his senses would knowingly choose the latter?

Probably the very greatest cause of the retardation of progress is, that we are too apt at looking for the easiest way of performing our work, instead of that way of effecting it that will bring the greatest good to those about us, without bringing everlastingly into the foreground of consideration, "but what is the effect upon *me* going to be?"

A poor, foolish, selfish fly has for the tenth time flown dash against a mirror at my back, in which the representative of an open window is very plainly delineated. Sometimes he comes with all his force against the thick, hard, polished glass with a thump and a rebound that stuns him for a moment; but recovering his equilibrium, he circles once or twice within the space of a few feet, and dash away he goes again to butt his poor head against the unyielding smooth reflector; and so he repeats and repeats the effort to go through the glass to the, to him, inviting field beyond, never stopping to consider that he may be wrong, until by utter exhaustion he at last falls bewildered, fatigued, and overcome to the soft reception of the delicate Brussels beneath, where he, as it were by chance, finds himself facing not the image of the window, but the window itself. As soon as he has somewhat recovered, he rises with the vigor and confidence of his former efforts, and lo! he scales the open vista, and to his great joy finds himself in the freedom of the open air, with liberty to soar

to his heart's content, till he becomes food for some member of the caprimulgus family; his incorporation into whose body we will not now attempt to trace.

I fear we too often retard our own progress as did the poor fly, by not being instructed by our failures and the rebuffs we meet. The fly acted upon the "try, try again" doctrine, and it is a doubtful matter whether he was ever aware of the reason of his success in the end. And unless we vary our plans and procedures we will be like him unsuccessful, unless by a fortuity our attention is directed to another line of tactics.

Failures *well observed* are quite as sure to advance us as unexpected successes; for failures sting us into closer investigations which point out the reason of non-success, while spontaneous successes lull us to a soporific confidence in our "*genius*," which is the more common cause of our attempting things too far ahead of our development for regular and certain accomplishment, and induces us to depend upon our "good luck" and boasted "*habit* of succeeding."

The next most potent cause retarding dental progress, is the low standard at which we aim. Most dentists, as most men, are quite satisfied to be "as good as their neighbor," while he never becomes great or truly progressive who has not deeply burned into his every purpose and every act the desire to excel not only his immediate neighbors and associates, but his own best former effort. As the mind as well as the body becomes strengthened in the directions most used, so the "impudence of hope" habitually indulged finally becomes the medium of inspirations, the consciousness of which makes him who exercises it walk the earth an anthropos indeed.

We need not fear that we shall get too far ahead in doing practical good to be regarded as of the main body of the profession. For such is the genius of our body that the more they become convinced that they are behind, the more will they bestir themselves to prove that they are as well endowed and as necessary to the body politic "as any other man." And thus the ambition of laudable emulation will give place to the hollow practice of sheer pretense, or drive the unworthy from the vineyard as cumberers of the ground, which will no longer accept obsolete mutilations for preservations and restorations of deranged portions thereof.

Being satisfied with mediocrity prevents or limits ambition, and lack of this quality stands in the way of the desire to associate; and absence of social intercourse deprives us of a just knowledge of the true standing of our fellow-practitioners; so that when we by accident do hear of some great advance having been attained in some department of our specialty, we are slow to believe it, because it is so much above our accustomed state of mind that we are apt to regard it as impossible, or at most quite improbable that any mind has so far outstripped our plodding state.

If the past is any criterion by which to judge of the future, we may

confidently look for retardation to our progress in the exact ratio that we isolate ourselves and ignore each other's improvements and ideas of advancement, or we may be sure of rapid progress in the degree in which we recognize each other, fraternally associate, support the dental journals, and, above all, the dental schools.

This last is the great sheet-anchor to all correct dental physiology, pathology, and mode of practice. The schools are necessarily the focalizing points of the highest attainments, and the broadest fields of clinical application of doctrines and methods.

A great sin lays at the door of most of our best operators in this respect. Having a good paying practice themselves, and not knowing what the schools do teach, are liable to judge the faculties by the poorest specimen of all their graduates; and hence are honestly of the opinion that they can teach their pupils much better than they suppose they *can* be, or at most *are*, taught in the schools, and at a less rate of expense to the pupil, which is to most young men entering our specialty no small matter, as I can testify from extended observation. Now, instead of this being so, I hesitate not to say that there is not one practicing dentist on this continent who has the least claim to a first class standing, who would not be much benefited by spending a session at any one of the dental colleges.

So soon as every dentist who has undertaken to help any young man into "the dentistry business" shall make it the prime requisition of his course of instruction that he shall attend two full courses of lectures on the subjects taught in medical and dental colleges, the last of which must be at a dental school, we shall have taken a step in the advance that not only he, but every member of the profession and the community shall have abundant cause to rejoice over, not only for the good it brings to the tutor and the pupil whom he thus assists to an honorable stand in the profession and community, but every one who shall employ him in his whole after-career.

Does any one ask how the tutor, who thus generously supports the dental schools by sending pupils in his influence to their halls, is to be benefited? I answer, upon the return of his pupil, he will of course get by sharp questioning the whole course, so far as it was understood, and thus partake of the concentrated wisdom of the faculty, so far as it had found lodgment in the pupil's mind, without himself becoming a matriculant at the expense of his false pride, time, and college fees. To *big*-little men, who desire to absorb all possible and give out no more than they must, this is ample inducement to send all their students, and thus keep pace with the progress of the most earnest and active minds in the whole land and profession in this country and abroad.

The low estimate at which dental faculties hold their services, and the lack of earnestness in the fulfillment of their function, is by no means a

trivial cause of retardation to dental progress. So soon as each dental teacher in office or faculty shall take Paul's cue and "magnify mine office" to an approximate appreciation of its importance, we shall have swept away a deal of rubbish in the way not only of dental progress, but progress in a true physiology and pathology of the entire system. After which we shall as a body know how to distinguish between health and disease, and how and when to contribute so promptly to the well-being of the patients in our charge, that in a few generations we shall be blessed with a progression heart-cheering to every philanthropist that shall deal a death-blow to all our now most common operations of extracting and filling teeth, which in its turn shall also annihilate the necessity for doses and doctors to an extent not dreamt of by the dull, plodding, willing-to-stay-in-past-attainment sort of profession and people.

Then laying aside all these dead weights to our progress, let us buckle on the armor of our high mission in the spirit of noble volunteers, who are willing to lose their own lives in the blessedness of saving those of others more dear to their intensified affections, and thus make it possible for us to enter into the wholeness of life commensurate with the brightest ideal of the goodness of use in the exercise of the functions of good and true men in individual and associated capacities of private and professional function in present and prospective life.

RUBBER POLISHING WHEELS.

BY JAMES LEWIS.

THE readers of the DENTAL COSMOS, especially those who have occasion to use cork wheels for polishing "Rubber Base," will be pleased to learn that soft rubber makes a superior polishing wheel. For dental purposes, wheels varying from one inch to one and a half inches in diameter, and from a quarter to half an inch thick, will be most used. They should be fitted to suitable spindles or mandrels that can be quickly placed in and removed from the lathe, perfectly centred, and embraced between two disks of metal about half an inch less in diameter than the wheel, one of the disks being attached to the mandrel, the other tightened up by a screw.

In fitting rubber wheels for polishing, the same care should be exercised as in mounting a corundum wheel. The sharp angles on each margin of the polishing surface should be turned off with a sharp file so as to leave a *rounded* surface, otherwise they are apt to cut channels in the surface to be polished. The wheels being once in order, may be used in the same manner and for the same purposes as cork wheels, and will be found to possess the following desirable qualities: Durability—as they last for an indefinite period when properly used. Uniformity of action—

being entirely free from the thumping, rattling motion which always attends the use of crumbly cork wheels.

In using the rubber wheel the work requires to be kept wet as with cork, to avoid heating, also to avoid wearing the wheel. When the wheel works against a dry surface it wears itself away, which does not appear to be the case if kept wet.

After having reduced a surface by means of the rubber wheel and pumice-stone, the wheel and the article to be polished may be washed clean, and the surface may then be reduced to a very good polish by means of tripoli, (pulverized rotten-stone,) in the place of pumice-stone. The work is then ready for finishing with the brush wheel, as in the usual manner.

The rubber wheel is not likely to be confined wholly to reducing the surface of rubber base, as it seems to be remarkably fitted for reducing metallic surfaces, and may also be used on ivory, bone, horn, shell, marble, and a great variety of substances.

I was led to try rubber as a substitute for cork wheels, from a desire to escape the annoyances incident to the breaking and crumbling of cork. My first experiment was with a disk of rubber cut from the heel of an old rubber-shoe—and was all that was needed to demonstrate the superiority of rubber to cork. A better article, however, may readily be obtained at any manufactory of rubber goods.

MOHAWK, N. Y., Oct. 1, 1863.

SELECTED ITEMS.

BY HENRY S. CHASE, M.D.

ERO-VAPOR STOVE.—This article, a cut of which can be seen in Dr. S. S. White's *Dental Catalogue*, is a very useful piece of laboratory furniture. I would not do without it for many times its price. It is especially useful in the summer, when one has no fire about his office. With it I melt lead and zinc for dies, boil water, heat up flasks for packing, etc. etc. Zinc melts in twenty minutes, and lead in ten.

PACKING FLASKS WITH RUBBER.—I was formerly troubled, more or less, to get the right quantity of rubber into my flasks. Sometimes there would be too little, thereby making the work imperfect; then again so much that the flasks would be brought together with much difficulty. I make my *trial* plates of equal parts of beeswax and paraffine and wax melted together. When I remove this wax from the flasks, I pack in its place two and one-fourth times its weight of rubber. This I find to be only a little in excess of what is actually needed, and the balance is easily contained in the waste gates.

Suction Cavities.—If these are formed in the plate, I think they should be very shallow. In the case of vulcanite sets, I would not make them until after a trial of the teeth without. There is generally sufficient suction in rubber plates, where the impression is taken in plaster. If a cavity is desirable, it can be cut out after it is found to be necessary. There are serious objections to the cavities, as every dentist of many years experience knows.

Case.—Mrs. N. has worn artificial teeth for twenty years; has had three upper sets. Applied to me lately for one on vulcanite. Last set was on silver, with a very large suction cavity,—at least one-eighth of an inch in depth. Found, on examination, that the bone and mucous membrane from the palate had been developed so as to fill to its utmost capacity the suction cavity. This is a very bad case; the worst I have ever seen; the abnormal development having filled up a naturally deep arch, even with the alveolar border. I made a set on the vulcanite without a cavity, and the suction was all that could be desired.

Silver alloyed with Platinum.—Knowing that a dental friend in Vermont had been for many years using chemically pure silver alloyed with platinum, I have at various times endeavored to obtain the plate at the dental depots, without success, until about a week since S. S. White sent me some from his Chicago house. I have not had occasion to use it, and do not know its formula, as alloyed. Since then, my friend Dr. M. Newton, of Woodstock, Vt., sends me his formula:—

"Chemically pure silver	10 parts,	base plate.
Platinum . .	1 do.	

Solder for the same.

Chem. pure silver .	1 ounce.
Copper . .	4 pennyweights.
Spelter solder . .	2 do.

Melt silver and copper, and when at full heat and ready to pour, add the spelter; shake and pour as soon as possible. This solder will wear equally as bright as the plate, and flow smoothly."

Rubber Teeth on Silver Plate.—For the first patient who desires it, I intend to mount a set of vulcanite teeth on a silver plate; using silver for the palatine surface, up to the border of the alveolar ridge; using rubber on the outside of the jaw, and on the inside of the teeth. I expect to fasten the rubber to the silver plate by low, strong standards soldered to the plate, allowing the rubber to envelop them.

Independence, Iowa, October, 1863.

PROCEEDINGS OF DENTAL SOCIETIES.

PROCEEDINGS OF THE ODONTOGRAPHIC SOCIETY OF PENNSYLVANIA.

REPORTED FOR THE DENTAL COSMOS BY G. W. ELLIS, M.D.

A MEETING of the Odontographic Society was held on Tuesday evening, October 6th, 1863, at eight o'clock.

President, Dr. Kingsbury, in the Chair.

On motion, the regular order of proceedings was suspended, to enable Dr. N. W. Kingsley, of N. Y., to address the meeting, with the design of describing his "Artificial Velum," and demonstrating the method of its construction, from the taking of an impression to the introduction of the apparatus.

Dr. Kingsley commenced his remarks direct on Congenital Fissure of the Palate, by referring to the two methods of treatment, viz., uniting the parts by suture, or by filling the fissure with a mechanical appliance. He was strongly opposed to the surgical operation, on the ground of its being painful and unreliable, and, even when success was attained by a perfect union of the parts, all experience shows no *very marked* improvement in the speech followed; experience also proves that any other inconvenience resulting from the deformity other than its influence on speech is so slight as to be of no serious annoyance to the patient. Difficulties of deglutition with a fissure of the velum, and corresponding benefits arising from a union of the parts by suture, are so slight as, in his opinion, to make the operation wholly unnecessary.

The only necessity of operating at all is with a view of benefiting the speech. A grand distinction must be made between the speech and the voice. In fissure of the palate the vocal organs are perfect, the organs of speech are not. Voice is natural; speech is mechanical, and the result of association and education. In making speech out of voice the perfect, natural velum acts as a valve to direct the voice through the mouth, or through the nares, thus modifying it, and in connection with other organs making of it different sounds which come to be understood as speech. In a cleft palate the power to direct the voice is in a great measure lost, and speech is necessarily imperfect.

In a complete union of the parts by suture, the septum thus formed, in nearly every case, is so rigid and inflexible as to be without the power of controlling the direction of sound, and the speech is necessarily but little, if any, improved.

He illustrated these remarks and demonstrated these positions by diagrams on the black-board, and by a drawing of a supposed musical wind instrument, in which the analogy to the vocal tube was strikingly shown. He believed the only operation which promises real benefits to be the

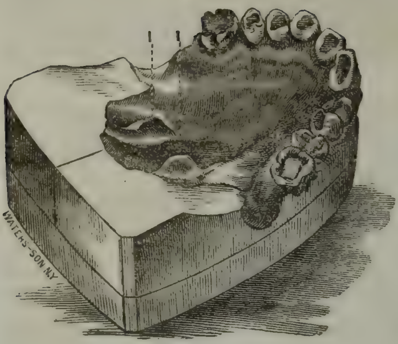
adaptation of an elastic artificial velum to the fissure, so soft as not to injure the surrounding tissues, so firm as to keep its place, and so flexible as to be controlled by the muscles in contact with it. An instrument possessing these qualities will render it perfectly possible for the patient to learn to speak well.

The metallic obturators, and all other appliances to plug the posterior nares in cases of congenital palatine fissure, are simply useless. It is physically impossible for perfect speech to follow their use.

In reply to some inquiries, he described his method of working plaster, and parting plaster casts from plaster moulds, which, although not altogether original, is but seldom practiced, and is far superior to the plan generally followed by dentists. By having a creamy solution of soap, in a vessel large enough to immerse the impression for a minute, and then wash off all the soap on the surface, a beautiful model will be obtained, which will separate readily and perfectly.

After these general remarks upon the subject, noting the almost total uselessness of such obturators as have been hitherto introduced, the admirable and wonderful accuracy of speech which may be acquired by perseverance with a well-adapted elastic artificial velum, and drawing a distinct and pleasing outline between *voice* and *speech*, remarking that in cases of fissured palate the former is perfect, while the latter is so defective as to offer almost total defiance to the comprehension of a stranger, he proceeded with an accurate description of the manipulation necessary for the construction of the apparatus, assisted by models, diagrams, etc. He stated that the first, most difficult, and probably most important step in the whole operation is the procurement of an accurate impression, which must embrace a perfect cast of all the boundaries of the fissure, together with the parts above and below its margin. The delicacy and irritability of the surrounding tissues render it necessary to establish a tolerance to the presence of a foreign body, such as plaster; this is accomplished by handling the parts, and bathing them with some slightly astringent wash several times a day; the first impression should extend but a short distance back, the second somewhat farther, and thus, by a gradual encroachment, together with the other preparatory measures, the impressibility will be so much diminished as to admit, after several sittings, of taking a full and perfect impression with the manifestation of little or no inconvenience. Plaster he regards as by far the best substance for this purpose, for since so little pressure is necessary in its introduction, the position of the soft structures remains unchanged, and a perfect impression is obtained of them in the normal position. To introduce and remove the plaster with facility, and, at the same time, secure a perfect result, requires the combination of skill and experience; it should be withdrawn as soon as it is sufficiently solidified to retain its form, when the upper portion will separate at the edge of the fissure, and may be removed by

Fig. 1.



sliding posteriorly. *Fig. 1, a sectional plaster model of a case of fissured palate, 1 1, the two prominences at the posterior border representing the remnants of the uvula. When the operation is so far advanced as to have obtained a satisfactory cast, a model velum of sheet gutta-percha or any other plastic substance should be moulded upon its surface with great nicety, and in such form as the permanent apparatus is designed to assume; this must be duplicated in hard rubber, which appliance may be cut, and otherwise altered until perfect, when it must be reduplicated in an elastic and serviceable material; experiment has demonstrated *elastic* vulcanized rubber to be the only substance which possesses the properties requisite to constitute an apparatus whose movements shall closely resemble the actions of the natural parts, perform their functions, and be retained in position without annoyance. The flexibility of the velum permits its compression by the muscular action of the lateral soft tissues, and insures its resumption of the original form as soon as the pressure is removed. To provide for this contraction of the posterior portion of the fissure, it is necessary that the velum should be constructed at the back part of two laminæ, one sliding over the other, or simply slit, with a third piece, or flap, to cover the opening, and prevent the escape of air through the nares. Fig. 2 represents the former, A A being the laminæ; B B, two bows of rubber continuous with the

Fig. 2.

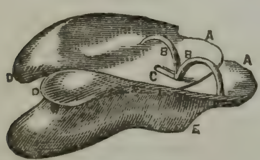
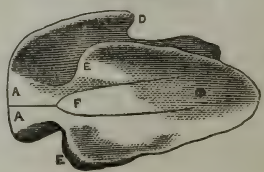


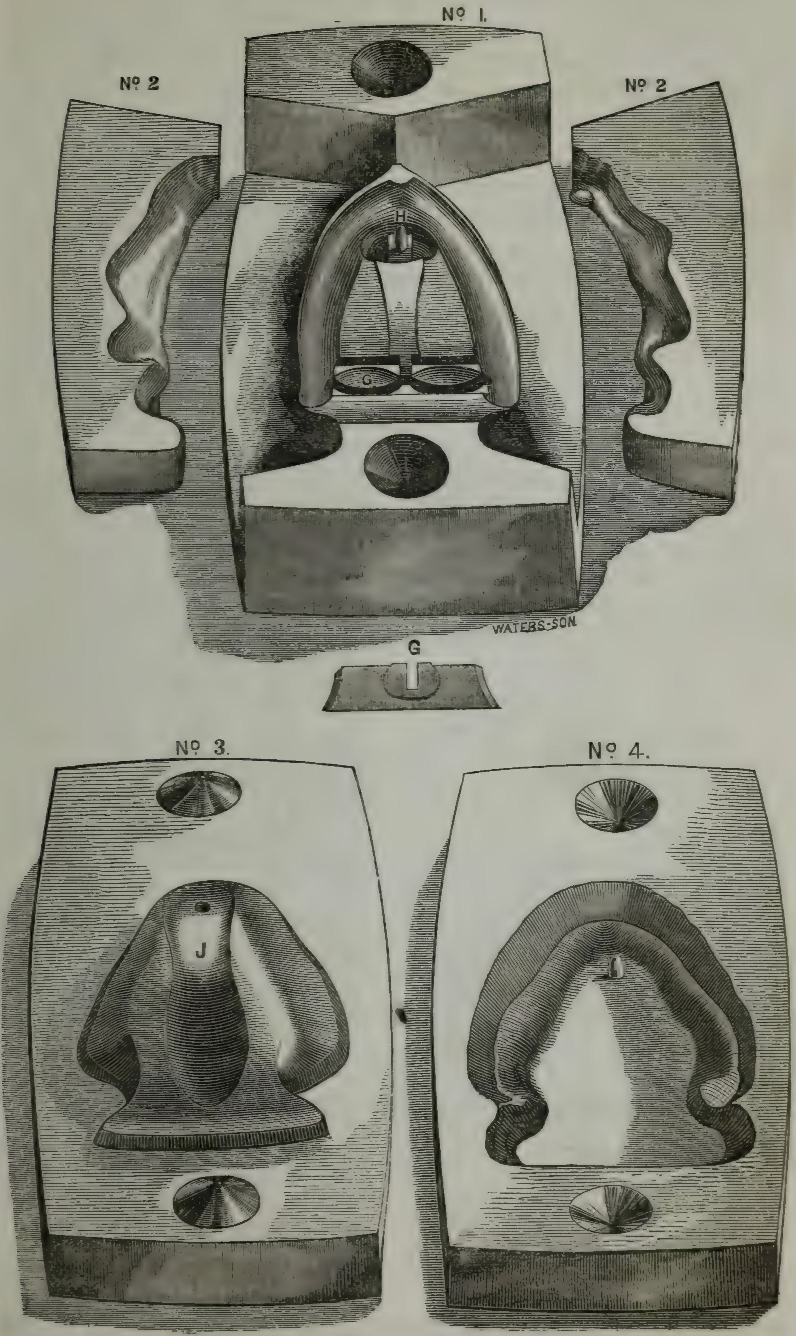
Fig. 3.



instrument passing through the slot C, and connecting with the lower layer; D D, the anterior portions of the superior alæ; E, one of the inferior alæ. A velum, consisting of three pieces at the posterior part, is shown in Fig. 3, being a view of its inferior surface. A A, the posterior edges of the lateral pieces; D, one of the superior alæ; E E, the inferior alæ; F, the flap covering the slit, retained in position by two bows, like B B in Fig. 2.

* For the illustrations we are indebted to Messrs. Lindsay & Blakiston.

Fig. 4.

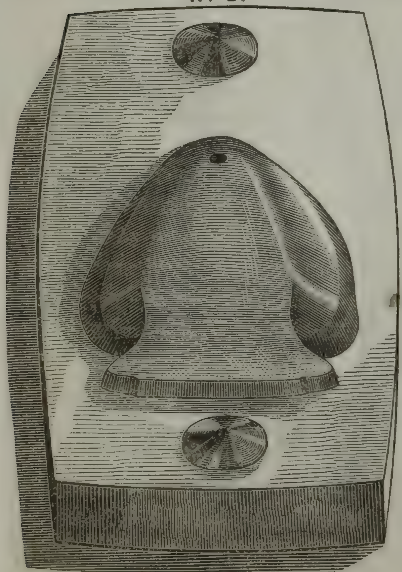


Having obtained a perfect fit in hard rubber, plaster should be moulded in sections upon its surface; the model thus obtained will not answer, however, for vulcanizing the final instrument, as the minute inequalities in its surface will produce similar imperfections in the rubber, which cannot be removed, and which, if allowed to remain, will interfere with its usefulness. It therefore becomes necessary to obtain from the plaster mould one of type metal, which presents a fine smooth surface, and may be retained for the manufacture of any number of vela. The rubber which is used for this purpose differs from the ordinarily prepared rubber; it vulcanizes with the desired elasticity in a steam heat of four hours, gradually elevated from 230° to 260° Fahrenheit. The following models and their descriptions are taken from the last edition of Harris' Dental Surgery. The article upon this subject was prepared by Dr. Dwinelle, and subjected to Dr. Kingsley's inspection before publication; consequently we can do no better than present his explanation of this intricate portion of an intricate subject.

"Fig. 4 shows the type metal mould. This mould is for packing and vulcanizing an elastic velum of three divisions. No. 1. Main piece or base of mould. The small block G is adapted to the mortise in the base also marked G. When in position, there is an opening through the centre of the block, and a groove from this opening passing out each side from under the block. This groove provides for forming the double arched bow as seen in Fig. 2. The pin H provides for a hole in the velum by which it is connected with a plate in the mouth, which assists in its support. No. 2. Two side blocks. No. 3. Top piece of mould with a depression J, to form the flap of the velum. No. 4 is used in connection with No. 3, to mould the flap separately, and afterward transfer it to No. 1. No. 5. Top piece to mould; but without depression to form the flap, as in No. 3.

Fig. 4.

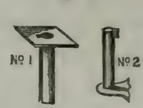
No 5.



"To pack a velum, elastic rubber, peculiarly prepared for this purpose, must be used. Cover with a solution of soap, all that part of the mould which will come in contact with the rubber, which will prevent the rubber from sticking to it when vulcanized. Put the side blocks No. 2 in place, and pack the space with rubber until filled. Put on top piece No. 5, and warm the mould, and press it together with strong clamps. Cool off the mould and open; if imperfectly packed, add more and press again. In

the mean time pack the depression J, in No. 3, with rubber, using No. 4 to press it into shape. Remove top piece No. 5 from the mould, and put No. 3, containing the flap, in its place, previously slitting the body of the velum, from the posterior end to near the apex, and put a slip of paper into the slit to prevent a union in vulcanizing. Put also a piece of paper under the flap for the same purpose, permitting the flap to unite at the forward end with the body of the velum."

Fig. 5.



By a very simple contrivance, such as presented in Fig. 5, a full upper denture is attached to a velum, and worn with great comfort. It consists of a gold tube, No. 1, grooved upon one side, which is secured to the velum; a rod of the same metal, No. 2, provided at its upper end with a slight projection, is fastened to the artificial case, and this being passed into the tube and turned firmly unites the two pieces of apparatus, admitting of their easy introduction and removal this connected. When, however, teeth are present, it is necessary to make some attachments by clasps, in order to prevent the velum from slipping backward, as the fissure is mostly much wider at its posterior than at its anterior portion.

The subject was handled in a clear and masterly manner, indicating the expenditure of much valuable time, labor, and thought in bringing it to its present perfection, and manifesting a thorough acquaintance with this specialty in all its bearings. He exhibited models of cases which he had introduced—the beauty and perfection of his plaster casts eliciting special comment as the results of educated, dextrous, and delicate manipulation.

Dr. Wardle moved that a vote of thanks be tendered to Dr. Kingsley for the admirable description which he had just given of his excellent apparatus.

Dr. McQuillen offered, as an amendment to Dr. Wardle's motion, that a committee of three be appointed to prepare a suitable testimonial to be presented by this Society to Dr. Kingsley in acknowledgment, not merely of the valuable improvement made by him in the artificial velum and palate, but also on account of the high stand taken by him in giving freely to his fellow-practitioners the result of his labors, in place of holding it as a secret, or adopting the course pursued by too many of patenting any small affair which by accident or design they may happen to introduce to the notice of the profession. A gold medal was suggested as an appropriate testimonial.

The motion and amendment having been agreed to, the Chair appointed Dr. McQuillen, Professor Morton, and Dr. Flagg a committee to attend to this matter.

Dr. McQuillen said he could not permit the opportunity to pass by without saying that the verbal description of the apparatus, which they had just listened to, had given him a clearer idea of the importance and

value of the improvement than he had been able to realize from the written description, and it would afford him additional satisfaction to have an opportunity of seeing the apparatus in use; the lucid and detailed account presented, however, left no doubt in his mind of the practical benefit that must accrue to the speech of those who may need and employ such an instrument. He was pleased with the nice distinction which had been made between *voice* and *speech.* He then referred to the defects which persons often labor under in speaking, and the necessity of correcting them by a course of elocutionary training under competent instruction. He instanced the case of Demosthenes, whose first efforts as an orator were of such a character as to offend the nicely-cultivated ears of the Athenians to such an extent as to induce them to drive him from the rostrum. His praiseworthy and successful efforts in overcoming the impediment under which he labored were well known. In these cases, it is true, the parties did not labor under the misfortune of having a fissure in the palate, but were merely required to correct a mental defect manifested in a precipitancy of utterance, denominated stammering. Persons who are so unfortunate as to have a palatine defect, and from childhood have spoken under such circumstances, would be compelled, of course, to put themselves on a systematic course of training after the introduction of the most perfect velum, to secure distinct articulation. Taking these facts into consideration, it was reasonable, therefore, to infer that however imperfect the speech may be in cases of congenital fissure, that with such an admirable fixture as the one presented this evening, distinct articulation could be acquired by care and attention on the part of the unfortunate person.

Dr. Flagg said that he desired, before the adjournment, to call briefly to the minds of members that phase which a portion of the remarks of Dr. Kingsley had presented prominently to himself. He had during the past eight or ten years of practice devoted himself particularly to the study of those conditions which, presenting for the consideration of dental practitioners, had, for a marked concomitant, *pain.* It had been his endeavor to institute such mode of treatment as would insure alleviation from such suffering, and accomplished the result by methods of manipulation, or applications of remedial agencies painless in their action. He urged that the practice of dentistry could, and should be, divested of all those *inflictions* which were of such universal experience as to be regarded by many of the community as the *necessary accompaniments* of dental operations, and desired that every true dentist should take especial trouble to so *preach* and *demonstrate* by his works as to disseminate the truth that dentistry was a medium through which, in proper hands, might be offered not only almost immediate relief from the various forms of odontalgia, without resort to the dreaded operation of extraction, but, on the contrary, by means devoid of pain; that

sufferers from toothache ought to be educated in the knowledge that the dentist was their best friend, and that at his hands, comfort could easily and surely be obtained. He regarded the domain from lips to pharynx as belonging to the dentist, and held to the opinion that all disease or deformity which pronounced itself in that locality, whether proceeding from local or constitutional causes, *ought* to be *best* treated by practitioners of the dental specialty; among these, that condition which to the general surgeon indicated a staphyloraphic or staphyloplastic operation, most certainly was included. But he wished to be distinctly understood as not desirous of *transferring* the performance of those operations from the general to the special surgeon, but to urge their almost entire abandonment by both. He would inquire, in a few words, what end was to be gained by their performance? Was it improvement in deglutition? He had repeatedly and universally been informed by patients, representing even the most extended instances of congenital fissure, that there was no difficulty in this direction, either with solids or *fluids.* Then why attempt improvement? Was it to improve articulation? He had *seen* nothing but failures in this direction; and had it from practitioners of eminence, that their results in the perfection of speech amounted practically to nothing. It was well known to the gentlemen present, that the operation was a painful and difficult one; that denial from speech, food, and even the act of deglutition, must be practiced for several days; that it very often was entirely (*so called*) unsuccessful; that is, union of the parts was not obtained; and that, in his opinion, for the most part, these should be regarded as the operations resulting in the greatest good to the patients!! for, with this result, they were still left in a condition which, if the remarks of their New York friend were well based, could be so acted upon as much to improve the articulation without interfering with the deglutition already good; a result which it was impossible to obtain if "union" ensued from staphyloraphy, until that union was again destroyed by the knife. He thought this subject was one for serious consideration on the part of any one who proposed inflicting upon one of his fellow-creatures so much suffering, with the constant evidence of the obtaining, *at best*, such a deplorable result.

Adjourned.

An adjourned meeting was held on Tuesday evening, October 13th, 1863, at eight o'clock.

Vice-President, Dr. Kingsbury, in the Chair.

The minutes of the previous meeting were read and adopted.

Dr. McQuillen presented a number of letters which he had received from gentlemen residing in various parts of the country, who had been elected corresponding members of the Society; all of them acknowledging

the pleasure with which they accepted the appointment, and expressing a warm interest in the organization; among others was one from Dr. C. W. Spalding, of St. Louis, Mo., in the course of which he refers to the importance of making *thorough* explorations of the mouth as follows:—

"Allow me, just for a moment, to call your attention, and that of your Society, to the subject of making examinations of the teeth, and of giving subsequent professional advice.

"So far as I know, a large portion of the dentists in this country are in the habit of giving such counsel and advice gratis; and, as a consequence of the service being rendered gratuitously, it is generally hurriedly and imperfectly done. How often do we find cavities, by no means small, that must have been overlooked at an examination made not many months before, either by ourselves, or by some other reputable practitioner!

"It is no small task to thoroughly explore a full denture, and determine whether any, and if any, what operations are necessary at this, or will be at any subsequent time.

"Now, it strikes me that this practice, now so prevalent, is all wrong, and that it is quite time it was corrected. When an examination is to be made, I say, take sufficient time; do the work thoroughly and well, and then charge a reasonable sum for the valuable service you have rendered your patient. Such services can only be rendered by a competent professional man. They are valuable, and a fair remuneration for his time and skill is no more than his just due.

"Why will not your Society help us in taking a step in the right direction, in endeavoring to correct this error?

"I might say much more in elucidation of the subject, but all that I could say, and more, will at once suggest itself to the minds of your members, at the bare mention of the topic."

The following paper was then read:—

"ANÆSTHESIA."

BY DR. AMBLER TEES.

A humane and sympathetic surgeon is always desirous of performing the duties of his calling with the least amount of pain consistent with the perfection of the operation, and the well-being of his patient. As the pain attendant upon close contact of the scalpel or lancet with nerves, tissue, and blood-vessels is often agonizing, it is not to be wondered at, that for ages the minds of physicians, surgeons, and scientific men have been dwelling upon the means of destroying the sense of feeling of a fellow-creature, while undergoing surgical treatment; and not until the present century has success attended the efforts made in this direction.

That our forefathers hoped and longed for the discovery of anæsthetic agents, we have ample proof. I have seen a book published in London about two hundred years ago, containing a comic poetical illustration of this subject; this was republished in the *Dental Monitor* in 1855. I crave your indulgence while reading it, not because it contains many very

brilliant gems of thought, but because it shows how many years and even centuries may pass before experiment or accident reveals certain objects or ends sought for,—and because it proves that *all* inventions cannot be originated to order.

Anæsthesia is accomplished: first, by the inhalation of nitrous oxide gas, ether, or chloroform; second, by electro-magnetism; third, by local appliances.

Nitrous oxide or the peroxide of nitrogen, sometimes called from its peculiar effects *laughing gas*, is manufactured by decomposing nitrate of ammonia. The latter substance is subjected to a heat of 500° in a retort. It is resolved into water and nitrous oxide, one atom yielding three atoms of water and two of nitrous oxide. The water condenses in the neck of the retort, and the nitrous oxide is received in a pneumatic jar. It has a sweetish taste, is colorless and transparent. When breathed it is very rapidly dissolved in the blood, and carried by the circulation to every part of the body, oxidizing everything in its path, and producing transient intoxication. It is necessary to inhale it about two minutes to effect insensibility to pain. This will last about two minutes more, when it requires a repetition of its inhalation for further operations.

This gas is exciting a great deal of attention at the present time among the dental profession, as it is said to be perfectly harmless, and unattended with the unpleasant influences and effects very often arising from the inhalation of ether or chloroform. The apparatus for manufacturing it in large quantities can now be obtained at the dental depots.

Sulphuric ether is a colorless liquid, of a sweet odor, and slightly burning, pungent taste. It is prepared by the distillation of alcohol and oil of vitriol. It is volatile, evaporating rapidly with the production of cold. On this account it is sometimes used as a local anæsthetic, with partial success. It will relieve the pain of a burn, if applied while the part is subjected to a stream of air. In earache it sometimes produces immediate relief, if dropped into the ear.

In 1844, Dr. Horace Wells, of Hartford, Conn., demonstrated the practicability of inducing an anæsthetic condition by the inhalation of nitrous oxide gas, and also the vapor of sulphuric ether; but, although he gave this information to many prominent scientific men, it nevertheless attracted but little notice until 1846, when attention was again drawn to ethereal inhalation, by Dr. Morton, a dentist of Boston, who, by calling it "Letheon," gained for it notoriety through the means of mystery. As usual with all discoveries, there are several claimants of the honor of suggesting the use of this agent to produce insensibility to pain, which is now used throughout the world. The vapor should be mixed with the air, and for that purpose it should be inhaled through a sponge, and applied over the nostrils in preference to the mouth—the fingers being kept on the pulse; and in case of its becoming feeble, the sponge should

be removed until the circulation becomes more free. It produces its effects in from two to five minutes. The dose is about two fluid ounces. When it is good, it evaporates from the hand without leaving a disagreeable odor. It is very inflammable. Death has ensued from the use of ether in but very few cases; the number being infinitely small, when we consider the great extent to which it is used. It is preferred to chloroform, on account of the greater danger of using the latter agent.

Chloroform is a colorless liquid, of a very sweet and burning, pungent taste. It is made by distilling a solution of chloride of lime and alcohol. It is heavier than ether, and unlike it in not being inflammable. On this account chloroform is a better solvent, as no danger need be apprehended from its taking fire.

It decomposes when subjected to the light, and should therefore be kept in a dark place. Like ether, it is apt to be impure. If pure, it will remain transparent at the bottom of the glass. It was discovered by Mr. Samuel Guthrie, of Sackett's Harbor, N. Y., in 1831. He supposed it to be chloric ether, the well-known oily liquid of the Dutch chemists, but it proved to be what is now called chloroform.

In 1847, Dr. Simpson, of Edinburgh, in searching for a substitute for ether, at the suggestion of Mr. Waldie, tried chloroform. Its advantages over ether are smallness of dose and more prompt action, besides being cheaper. Insensibility is produced in from one to two minutes. The dose is a fluid drachm. It is dangerous to give a full dose. There have been more deaths reported from its use than from the use of ether. Equal parts of chloroform and alcohol have been commended as the best anæsthetic agent, the latter obviating the depressing influences of the former.

Chloroform should not be administered to persons subject to epilepsy, or affected with organic disease of the heart.

Anæsthesia by electro-magnetism was discovered by Dr. Frances, of this city, a few years ago. The forceps being attached to the positive wire, and the patient's hand clasping the negative, a current of electricity is established as soon as the forceps touch the tooth. The tooth is then drawn, it is said, without pain. It excited a great deal of attention at the time, and several committees were appointed by various bodies to investigate its merits. Some of these decided in its favor, while the others ridiculed it. A brother dentist tells me that he has used it with entire success, and that he could not do without it.

The most successful local anæsthetic is the freezing mixture of ice and salt. This was first used in dentistry by Dr. Branch, of Illinois, in 1855. He employed a cylindrical receptacle, made of gutta-percha, with one end covered with a piece of bladder or membranous sac, and the other end closed, when ready for use, by means of a screw cap. Into this cylinder, pulverized ice and salt were introduced, a spiral spring inserted to press it toward the covering, and the cap screwed on. The mixture,

inclosed in the bladder, was then applied to the tooth and gum until the latter assumed a white appearance, and the tooth then extracted. I have had some experience with this agent, and the only objection I have to it is the trouble of preparing the mixture, and the difficulty of applying it to the back teeth. I have been successful in extracting teeth without pain, in about six or seven cases out of ten.

On account of persons being of different temperaments, it is impossible to arrive at definite conclusions with regard to the success of the two last named methods of producing anæsthesia. Some will tell us that they did not experience the least amount of pain; others will assure us the pain was very slight; and others again will affirm that the pain was very great indeed. Some will give manifestations of intense agony during the performance of the operation, and after it is done will coolly tell us that they felt no pain whatever. Of the truth of such assertions I have satisfied myself. On one occasion, before extracting a tooth for an Irish girl, which class of people I had been told would scream at the least provocation, I examined her mouth, then picked up the forceps, and deliberately held the instrument within half an inch of the tooth for a few seconds. The yell she uttered would have startled me, had I not been prepared for it.

Cases often occur in every dentist's practice, where it is expedient and proper to make use of an anæsthetic; and it would be well, therefore, for us all to take this subject into serious consideration,—to experiment under competent instructors on the various agents, so that we may arrive at a definite conclusion in regard to one or more of them; to adopt and perfect ourselves in the one that we prefer, and to use it in such instances as our judgment and conscience may permit.

Dr. Flagg said that he believed himself correct in asserting that no death of a human being had ever ensued as the result of ether inhalation, for the purpose of inducing the anæsthetic condition.

There had been cases reported of death from ether, which were either accompanied with "*no reaction*," "*not the full effect of insensibility*," "the suffering of pain during the operation," etc. etc., and the continuance of vitality, after the completion of the operation and the usual passing off of ether symptoms, for periods varying from twenty-four hours to several days.

The experiments which had resulted in death were performed on animals with sulph. ether, to the entire exclusion of atmospheric air; and in these it had been demonstrated that inhalation of ether *alone*, for a period of several minutes *after* producing a decided effect upon the medulla oblongata, was necessary for the destruction of vitality.

Dr. McQuillen, from what he had seen of and read about ether, felt pretty well assured that, if any case of death had occurred from its exhibition, it must have been due to gross carelessness on the part of the

operator, and might be regarded as caused by suffocation rather than etherization. The consideration of this part of the subject brought vividly to his mind the objections which Professor Meigs urged with considerable pertinacity, several years ago, against the employment of anæsthetics in the labors of childbed. These objections, as is well known, are embodied in a letter addressed to Professor Simpson, of Edinburgh. About that time Dr. McQ. was engaged in his medical studies at Jefferson Medical College, and recalled rather an amusing instance in which Professor Meigs, to demonstrate the dangerous nature of ether, informed the class in attendance upon his lectures that he would on a certain day etherize two animals before them, and that in a very short time life would become extinct in the animals. At the hour appointed a sheep and a lamb were placed in the amphitheatre of the lecture-room, and the ether was administered to them in the most liberal manner for more than an hour, without inducing the result which had been so confidently anticipated and announced beforehand.

Dr. Kingsbury stated that the paper that had been read treated of a subject in which he had for a long time felt a deep interest. No one would wonder at this fact when he stated that the person who first demonstrated the idea and practicability of anæsthesia in dental and surgical operations was not only a relative, but a dear friend and associate of his early youth. He loved to reflect upon the happy hours he had spent with him in the joyous and innocent gambols of school-boy days. As a boy, Horace Wells was full of vivacity, quick in his perceptions, genial in his disposition, keenly sensitive, generous to a fault, with a high sense of honor and moral obligation. He also possessed, in combination with these qualities, great ingenuity. His early associations and recollections of him were such as to justify the application of those beautifully touching lines:—

"Green be the turf above thee,
Friend of my early days;
None knew thee but to love thee,
None named thee but to praise."

He believed that it was conceded by all who were acquainted with the history of anæsthesia, that to Horace Wells, of Hartford, Connecticut, belonged the honor of demonstrating that a certain class of agents, by their inhalation, would induce an anæsthetic condition, such as to secure complete immunity from pain under surgical operations. But for his untimely death the world would have awarded to him and his posterity the meed of honor, if not the generous pecuniary reward so justly due. Justice is often tardy. But the day of reckoning will certainly come; and he was confident that justice would yet be done. Those present, who were acquainted with the history of this subject, and the unblushing, arrogant, and persistent efforts that had been made by certain parties to deceive

the medical and dental professions, to establish false claims, and obtain from our Government a munificent appropriation, would require no key to unlock the import of his remarks. He would say no more at that time in regard to the discovery of anæsthesia. Strange as it may appear there were some persons in the medical and dental professions who questioned the admissibility of anæsthetics in operations involving great suffering. Among them may be found some who occupy high positions in medical science. Dr. Simpson, in his work on Anæsthesia, has brought forward many strong arguments to silence these unreasonable objectors. Yet there is one argument of the most conclusive character that he had never seen mentioned in connection with this subject. It seems to have been entirely overlooked.

The first surgical operation of which we had any account—the record of which all must acknowledge reached back to a very early period in the history of our race—was performed before the fall in the garden of Eden upon Adam our common father. It consisted in the extraction—not of a *tooth*—but of a *rib.*

And was it not a most remarkable fact that it was performed while the subject was in an anæsthetic state? not only so, but he was previously put into that peculiar state for the express purpose of having the operation performed.

"And the Lord God caused a deep sleep to fall upon Adam, and he slept; and he took one of his ribs, and closed up the flesh instead thereof." —*Gen.* ii. 21.

What change the organization of man's physical system underwent at the time of his fall, as it respects living tissue and the functions of the nerves, he would not pretend to be able definitely to determine. But this much we do know, that "flesh" and "bone" were essential tissues in Adam's physical structure in his state of original innocence. They also entered into the framework of his helpmeet, Eve. For upon her presentation to him, he exclaimed, "This is bone of my bone, and flesh of my flesh." Where there was flesh and bone in a vital condition, there was, of necessity, a vascular and nervous system. It was fair, therefore, by parity of reasoning, to conclude that the violent separation of the living tissue of Adam's body, while in a normal condition, would be attended with pain before his fall, as well as after it. Now, as there could be no such thing as pain or suffering in man's sinless and perfect state, we see the goodness and wisdom of his Creator in placing him in an anæsthetic state, that there should be perfect immunity from pain or discomfort in the removal of the rib out of which to form a woman to be a helpmeet, part and parcel of himself. There was a striking similarity between the "*deep sleep*," induced in Adam's case, and that which is induced by the proper inhalation of nitrous oxide, ether, and chloroform. That the Great Operator, in the case cited, had the skill to have adopted some

other means equally successful to the end proposed, we had no reason to doubt. But that he chose the means he did from his resources of infinite wisdom was a most significant fact, which not only amounted to a *permission*, but was a plain *indication* that in all subsequent operations upon the human subject, involving suffering, the surgeon or dentist had the Divine warrant and sanction for the employment of the best agents for inducing a temporary suspension of nervous sensibility in order to secure immunity from the pain otherwise pertaining to such operations.

Dr. McQuillen was present on an occasion some years back, when Morton gave a description of his reputed discovery. Prior to that he had regarded Morton's claims as superior to those of Horace Wells; but the impression made upon his mind by that description was, that the speaker had very little, if anything, to do with the *discovery of the anæsthetic properties of ether.* This conviction was still further confirmed by several interviews which he had with him subsequent to that. There was such a manifest want of familiarity with the most ordinary relations of the subject, that it is a matter of surprise that any one who has once heard him could for a moment credit him with being the kind of man that would be likely to institute a series of careful and long-continued experiments, with the view of ascertaining the relative anæsthetic properties of various substances. On the other hand, it is a well-known fact that Wells possessed the peculiar temperament and mental endowments which would naturally lead to the prosecution of such investigation, and that Morton was a student of this gentleman at the time when he was thus employed. Dr. Wells' claim to the credit of discovering the *anæsthetic* properties of ether might be questioned by some persons, but no one, certainly, can deny that he was the first to practically demonstrate that anæsthesia could be induced, by the inhalation of certain substances, to such an extent that painful surgical operations could be performed without the knowledge of the patient.

Dr. Flagg remarked that the present conduct of discussion seemed not to indicate an arrival at that experience and material which might be of very wide-spread benefit to the members present, and to those of the profession who read the proceedings of the Society. He thought that the discussions upon this subject, which are reported from various organizations, though good so far as seemed feasible, were yet devoid of that systematic and practical instruction, which might possibly be obtained from a somewhat different treatment of it. He would, therefore, propose that a *seriatim* method of investigation, demonstration, and discussion be pursued; that the substances or compounds from which the various anæsthetic agents were obtained, be exhibited and described, and that their manufacture be demonstrated, so that all should have clear ideas in this direction; that the materials having been obtained, practical illustrations of their employment should be given, their effects noted, and their

probable modes of action discussed; that measures for the removal of untoward signs or symptoms, should such supervene, be suggested, and the *rationale* of their employment be arrived at if possible.

Therefore, as the protoxide of nitrogen was the gas, by means of which Horace Wells, a dentist of Hartford, Conn., first demonstrated the feasibility of the induction, by inhalation, of anæsthesia, during the performance of a surgical operation, he suggested that its description, and a demonstration of its manufacture, be requested at the hands of Prof. Morton.

Professor Morton said that nitrous oxide, or the protoxide of nitrogen, may be obtained in greater or less purity by several processes :—

1st. By decomposing nitric oxide by the long-continued action of iron filings, or other absorbent of oxygen.

2d. By the action of dilute nitric acid upon zinc or tin.

3d. When nitrosulphate of ammonia is thrown into an acid.

4th. By dissolving protochloride of tin in hydrochloric acid ; heating the solution in a retort over the water-bath, and dropping in crystals of nitre through a tube dipping into the liquid.

5th. By heating the nitrate of ammonia in a flask or retort until a gentle ebullition takes place in the fused salt, and keeping up this action until the material is nearly exhausted.

The gas is obtained in a pure state only by the last two methods; the last of all, on account of economy, ease of manipulation, etc., being the one practically employed. The decomposition here is as follows: $NH_4O,NO_5=4HO,+2NO$. Water and nitrous oxide being the only products, the flask would be left empty, if the operation were continued long enough, which a prudent regard for the safety of our glass flask alone forbids.

Where the salt used is somewhat dry, a little difficulty often arises from frothing at the beginning of the operation; the addition of a few drops of water, or very careful regulation of the heat at the outset, will avoid the inconvenience, which is not permanent, as the generation of water during the decomposition soon so *thins* the fused salt that frothing cannot be induced. The heat during the process should be well regulated, as too high a temperature may cause the development of nitric oxide, which would be very injurious, if inhaled, or even of pure nitrogen, which would be, of course, a diluent, diminishing the efficiency of the gas. The nitric oxide might be removed by passing the gas as generated through a washing bottle, containing a solution of protosulphate of iron, which would absorb the impurity, but not the required product. The absorption of this gas by water ($\frac{3}{4}$ vols. being so taken up) makes the ordinary pneumatic cistern an objectionable means of collecting it; yet it should come in contact with some water to remove such impurities as a trace of nitric acid, which may sometimes occur, and have some opportunity of deposit-

ing the water which accompanies it as steam in its exit from the flask or retort. These ends would be best subserved, on the large scale, by the use of a copper gas-holder as a reservoir, and an India-rubber bag of two or three gallons capacity as an inhaler.

In illustration of these remarks, Prof. Morton heated some nitrate of ammonia in a glass retort, and obtained a large quantity of the nitrous oxide, which was tested by the members present.

Dr. McQuillen referred to Dr. Arnott's improved mode of using refrigeration as a local anæsthetic, and suggested that possibly it might be made available in the extraction of teeth.

Dr. Tees had tried Dr. Arnott's method, but failed; this, however, was probably owing to the want of thorough application, having used but a single iron.

Upon motion, the subject was continued for discussion at the next meeting.

Adjourned.

PENNSYLVANIA ASSOCIATION OF DENTAL SURGEONS.

REPORTED FOR THE DENTAL COSMOS BY G. W. ELLIS, M.D.

The annual stated meeting of the Association was held on Tuesday evening, October 6th, 1863, at eight o'clock.

President, Dr. Fouché, in the Chair.

The following officers were elected for the coming year:—

President.—Dr. W. W. Fouché.

Vice-President.—Dr. Spencer Roberts.

Recording Secretary.—Dr. James Truman.

Corresponding Secretary.—Dr. G. W. Ellis.

Treasurer.—Dr. S. Dillingham.

Librarian.—Dr. T. L. Buckingham.

Committee on Membership.—Drs. C. N. Peirce, G. T. Barker, and J. W. Van Osten.

The Committee on Membership reported the names of Drs. E. N. Bailey, W. W. Townsend, J. Iden Singley, I. S. Fogg, E. E. Hopkins, and E. T. Longstreth, who, upon separate ballot, were unanimously elected members of the Association.

Other matters of business pertaining to such meetings were transacted.

Dr. Wildman, who was expected to open the subject of "Palatine Defects" at the next discussional meeting, requested a deferment of the subject, in order to enable him to procure, if possible, some appliances, which would prove of interest in this connection.

Upon motion, it was postponed, and the subject of "The Manner of Taking Impressions" substituted.

Adjourned.

THE regular monthly meeting of the Association was held on Tuesday evening, October 13th, at eight o'clock.

Vice-President, Dr. S. Roberts, in the Chair.

The subject for discussion,

"THE MANNER OF TAKING IMPRESSIONS,"

was opened by Dr. Buckingham, who said that the securing of an impression was one of the first and most important steps in the construction of an artificial denture. Various substances have been used for the purpose, but the preference is now mainly accorded to two materials, wax and plaster. Wax is frequently found impure from the admixture of other articles, which deteriorate its usefulness, and render it unfit for the requirements of the dentist. He referred to the peculiarity of lumpy or granular wax, and regarded toughness as an indispensable quality for the production of an accurate impression. He is in the habit of procuring from 15 to 20 pounds of crude wax, melts it in a tin vessel, and pours it into porcelain plates, in order to give it a desirable and convenient form. This method possesses the advantages of securing a good article at a very economical rate; a pure and clear specimen of which he placed upon the table for examination. He rarely or never uses wax the second time, except for the same patient, and thought it important to be very particular in this respect. To bring the wax to the proper consistency he warms it by the fire, and kneads in order to thoroughly incorporate the particles, render it tough, and establish a uniformity of temperature throughout the mass. He objected to the use of hot water for softening the wax, on account of the granular condition which it induces. He exhibited his impression cup, which is made of German-silver, and gave the preference to this metal, as the sulphuric acid contained in plaster produces no effect upon its surface. His plan is to first take an impression in wax; this he chills by immersion in cold water, and employing it as a cup, covers it with plaster, taking his final impression in that material.

Dr. Barker said that his attention was at first attracted toward the subject by the perusal of an article from the pen of Dr. Abr. Robertson, to a portion of which he would take exception. He says:—

"Some recommend first taking an impression in wax, as near as may be, from which models are to be made, and a plate struck, into which a small quantity of a very thin batter of plaster is poured, and placed in the mouth.

"Some pour a similar batter of plaster into the wax impressions and replace that in the mouth.

"Both these methods, according to my observation and experience, are entirely futile. So thin a coating of plaster has not strength enough to amount to anything: not half enough to sustain its removal from the mouth, and it is almost as likely—more so, if left in a little too long—to adhere to the mucous membrane of the mouth as to the wax or the plate into which it was poured. Always, or most generally, at least, more or

less of it will be found adhering to the mouth in little patches, often leaving the impression less perfect, and much more rough than the original wax one."

And he also states that—

"This should remain in the mouth, great care being taken that it is not moved in the least, after it has been properly placed there, till the plaster has fairly set—no longer. If allowed to remain too long, it is more difficult to remove, and there is also some danger then of removing some of the mucous membrane of the mouth along with it; care is therefore necessary in removing the impression, or injury may be inflicted."

His experience was directly opposed to these statements; for he finds a wax impression to constitute the most desirable cup for retaining the plaster, which he allows to remain in the mouth until perfectly hard, observing no difficulty from its adherence to the mucous membrane. He regarded the relation between the impression and the artificial denture the same as that existing between the foundation of a house and the superstructure, since it is just as impossible to produce a perfect result from an imperfect commencement in mechanical dentistry, as to build a durable house upon a false foundation; and, although this may be very generally appreciated, the carelessness so frequently manifested in taking impressions would hardly seem to indicate it. It is at first necessary to make a *thorough* examination of the mouth, in order to discover any possible peculiarities or difficulties, and if they exist, to devise means to meet and overcome them; for cases vary greatly, and it is impossible to prescribe a manipulative method universally applicable. He mentioned a case in which, from the existence of a hard central ridge and soft lateral parts, he failed in a first attempt to obtain an impression, but the discovery of this stimulated a somewhat different and more careful effort, which proved successful. He regarded plaster as the best material for taking impressions in all cases. He at first takes an impression in wax, trims off the surplus of that material at the posterior margin, scores the surface to retain the plaster, which, being placed on in a moderately thick layer, obviates the great contraction and expansion attendant upon the employment of a large body of this material. When there are teeth remaining, he places wax around them in order to facilitate the drawing of the plaster, and prevent extensive fracture of the impression; but when the teeth are all absent, as he before stated, he had rarely if ever had it adhere so firmly to the root of the mouth as to occasion trouble to himself, or annoyance and discomfort to the patient in effecting its removal. If teeth be present, and their unfavorable positions cause the separation of pieces of the impression in its withdrawal from the mouth, it may be rendered complete by their proper adjustment, and a perfect counter model thus obtained. In order to prevent the presence of air bubbles in the cast, which mar the accuracy of its surface, he adopts the method suggested by Dr. Calvert, of pressing the plaster backward and

forward in the mouth, so as to favor their escape. He thought there was great room for choice in selection of impression cups, and himself favored those constructed of hard rubber, in accordance with the suggestion of Dr. Townsend. He referred particularly to the awkward and absolutely painful tension of the oral integuments, oftentimes induced in the use of cups, where the exercise of a little judgment would certainly suggest the introduction of one side at a time; and the pursuance of the same plan as the easiest for its withdrawal.

Dr. Wildman has made use of wax and all its combinations. He at first employed the yellow exclusively, and afterward the white, finding the latter rather the most difficult to manage. He softens it in warm water, the temperature of which is previously tested by first dipping a small piece, thus indicating the heat necessary to soften its substance without injury to its quality of toughness. Paraffine and wax he also employs; and in its use is careful to avoid the scaliness caused by overheating. It takes a very sharp impression, and he gives it the preference over simple white or yellow wax. Gutta-percha and wax he has found less pleasant to use, although it takes a well-defined cast. Plaster is the material which, in his estimation, possesses the most desirable properties for the procurement of an accurate impression; and in partial cases, he pursues the plan stated in the May number, 1861, of the *Vulcanite*, of using a wax impression as a cup, so that the depressions in its surface will, upon its reintroduction, so embrace the teeth as to prevent the plaster from setting around them in such a way as to interfere with its easy withdrawal. He colors his plaster by the addition of a small amount of venetian red, in order that he may distinctly discern the margin between the impression and the model which is cast into it. In the preparation of plaster he sifts it gradually into the water first placed in the vessel, allows it to settle, and then beats in order to thoroughly mix. If it is desirable to hasten its setting, it is accomplished by the addition of a little salt, or the employment of tepid instead of cold water. When the saliva is thick and viscid, he dries the surface of the mucous membrane by wiping it with a napkin, so as to prevent the sliding of the impression, which its presence occasions, especially in the employment of wax. He casts into a plaster impression shortly after its removal, having first plunged into or coated with a solution of soap. The sulphuric acid of the plaster decomposes the soap by uniting with the alkali, leaving a film of fatty matter on the face of the impression which will prevent the cast from adhering. When the impression has been varnished, soap should not be used. The objection to drying and varnishing an impression, before casting into it, besides the loss of time, is, when salt is used, that it will crystallize upon the surface and mar its perfection. In answer to a question from Dr. Peirce, whether the pressure necessary to obtain a wax impression was not advantageous where the tissues were loose and flabby, he replied that it might possibly prove so in such cases.

Dr. Peirce believed that in such conditions of the mucous membrane, the pressure necessary to force the wax into all the indentations was really beneficial in securing an impression of the parts in such a compressed position as the contact of a plate must necessarily force them. He cited in corroboration a case of this kind, in which, after failure with plaster, success followed the employment of wax.

Dr. Buckingham had tried cutting out the wax impression, in order to secure a greater bulk of plaster between it and the roof of the mouth; this plan he has now abandoned, and pours the plaster upon the wax as removed from the mouth, in a layer about as thick as a silver quarter dollar; and, like Dr. Peirce, prefers the even pressure exerted by a perfect wax model. In the mixing of plaster he had never sifted it into the water, but prevented the presence of air bubbles by skimming them off, after having first stirred the batter sufficiently to bring them to the surface. He wipes all water from the wax model, in order that the plaster in contact with it may set sufficiently solid to prevent separation in removing them from the mouth. In partial cases, he has been in the habit of wrapping the teeth with a thin strip of tin, thus producing perpendicular surfaces, and insuring the easy and perfect drawing of the model. He coats the impression with a very thin varnish, and, in some cases, uses oil, absorbing any superfluity by the contact of tissue paper; in its employment, however, he is regulated by the character of the plaster used. If it be desirable to hasten the setting of plaster, he accomplishes it by the addition of salt. In taking an impression, he allows the plaster to thoroughly set, so that it becomes hard or brittle enough to fracture, before removing it from the mouth. He never scrapes the surface of a cast, unless it be defective.

Dr. Barker spoke of the idiosyncratic intolerance of the slightest pressure upon the soft palate, and the difficulty of obtaining satisfactory impressions in consequence of this peculiarity. His plan, in such cases, is to reduce the extreme sensibility by titillation with the bowl of a spoon, thus accustoming the parts to the contact of a foreign body. The following case occurred to him as illustrative of the importance of instituting a minute examination of the mouth. A gentleman, 75 years of age, presented himself for the insertion of a full upper denture. Four impressions were taken, and four plates introduced, without success; discouragement was beginning to succeed hope, when close scrutiny discovered a slight prominence consequent upon the late eruption of a dens sapientiæ; the removal of which and all difficulty were simultaneous.

Dr. Dixon always uses plaster, which he has employed for the last ten years; first taking an impression in white wax, which he hardens in the manner described by Dr. Buckingham, trims out deeply in the *anterior* part, and employs as a cup for the retention of that material. He liked the method of coloring the plaster employed, and demonstrated by Dr. Wildman. He mentioned a case in which the efforts for the removal of

the impression broke it in several places; the pieces were replaced upon the wax, which served as a guide and supporter, and the cast made practically as perfect as if no fracture had occurred. Where teeth are present he takes the model in sections; a plan of manipulation requiring some experience and dexterity, but with the ease acquired by practice, certain and satisfactory. He stated, in reply to a question, that Dr. Daniel Neall was in the habit of taking the articulation in wax, and the impression at the same sitting; thus saving the necessity of a second visit for the former purpose.

Dr. Barker spoke of the liability of false articulations, in the introduction of full upper and lower dentures, and the great trouble and annoyance which it frequently occasions. He has invariably overcome this difficulty, by the adoption of the invaluable suggestion of Dr. Burras, of New York, viz., to direct the patient to close the mouth and swallow; which effort will, of necessity, retract the lower jaw into its proper position.

Dr. Buckingham spoke of the necessity of constructing impression cups to meet the peculiarities of certain cases, and mentioned an instance in which he first obtained a cast in wax, this he covered with plaster, melted out the wax, and ran in molten tin, thus obtaining a cup of this metal. He always uses wax as a trial plate, for the insertion of cases on vulcanized rubber. Where there are teeth with which the work is to antagonize, he obtains the articulating bite by wax well pressed upon their *anterior* and cutting surfaces; when, however, the teeth are all absent, a second visit is necessitated for this purpose.

Dr. Dixon obtains his impression in wax, without the employment of a cup, and when cooled, has found it to answer every purpose, possessing sufficient strength for the retention, introduction, and removal of the plaster.

Dr. Wildman exhibited the model of a case, the impression of which he obtained by the use of wax in sections. It looked perfect, and was no doubt a very difficult cast to procure.

Dr. Buckingham, after having trimmed the wax impression at the posterior border, and filled it with plaster, is careful in introducing, to first press it well up in the back part, in order to prevent the plaster from dripping down the fauces, and also to insure its running well into the anterior portion of the mouth. When he uses wax alone, he obtains the impression, removes it from the mouth, chills it, and reintroduces several times, pressing firmly into place. By this means a very accurate cast may be obtained. He rarely, however, resorts to wax exclusively; believing, as he does, that plaster, of all other materials, will take the best impression.

Dr. H. Townsend first made use of wax and plaster, in the manner described, employing the impression of the former as a cup for the retention of the latter. This method, however, he has now abandoned, and

prefers using the plaster alone. He objected to using wax the second time, unless previously *melted* and *boiled*. In taking an impression with plaster he depresses the chin, so that it comes in contact with the chest, causing the material to gravitate forward, and thus preventing annoyance from its falling into the fauces. In reply to a question of Dr. Van Osten, he stated that in impressions of the lower jaw, he was not in the habit of building up the sides of the cast, but preferred the plate to fit the parts as accurately as possible.

Dr. Van Osten referred to the great adaptability of lower plates, and the impossibility of always obtaining a perfect fit at first. He is in the habit of building out these models at the sides, to avoid the cutting so generally experienced in this position, and also to insure with absorption, the production of a *broad* and *firm* foundation, upon which the plate may rest.

Dr. Buckingham said, in order to overcome the difficulty experienced from the loose overhanging folds of mucous membrane, the parts are rendered tense by directing the patient to raise the tongue, and at the same time distending the cheeks with the fingers of the disengaged hand. He never builds up a lower model, but prefers to have the plate accurately adapted to the parts upon which it is designed to rest.

Dr. Dixon advocated the doubling of lower plates to secure rounded edges, and prevent the cutting so often complained of.

Dr. Bailey said that in taking impressions of partial cases in wax, he cuts the cup to allow the teeth to pass directly through. It is much easier to manipulate, and a less body of wax requisite, than when it is left entire. He thought that the contraction and expansion of plaster were theoretical in their influence upon the perfection of a fit.

Dr. Dixon spoke of the importance of the perpendicular removal of impressions; and stated that, where no cup is used, he introduces into the body of the plaster a button, with a string attached, by pulling upon which he was enabled to detach it from the mouth in the desired direction.

Dr. Buckingham had known of the introduction of a string into the plaster, the removal of which was designed to admit air, and facilitate the withdrawal of the impression, but had never known it to be employed for the purpose stated by Dr. Dixon.

Dr. Bailey said that in the cases spoken of by Dr. Buckingham, where the parts are loose and flabby, he overcomes the difficulty by the employment of a deep impression cup, the pressure of the edges being sufficient to remove the duplicatures of the membrane.

Upon motion, "PALATINE DEFECTS" was adopted as the subject of discussion for the next meeting.

Adjourned.

DELAWARE DENTAL ASSOCIATION.

REPORTED FOR THE DENTAL COSMOS, BY S. S. NONES, D.D.S.

In compliance with a circular signed by several dentists residing in Wilmington, calling upon the profession throughout the State of Delaware to meet in that city on "Thursday, the first of October, at eleven o'clock A.M., for the purpose of organizing an association for mutual improvement—professionally, scientifically, and socially"—a number of practitioners assembled in a public hall at the hour named, and organized by appointing Dr. W. G. A. Bonwill, of Dover, *Chairman*, and Dr. J. P. O'Daniel, *Secretary*. The circular stating the object of the meeting having been read, after some discussion,

On motion, a committee was appointed to draft a plan of organization. The committee were Drs. Bonwill, Nones, Marshall, and Shelp.

The meeting then adjourned until two o'clock, so as to afford the committee time to attend to the duty assigned them. At the hour appointed, the meeting again assembled, and the committee submitted a plan, which, after being read at length, was taken up, section by section, and adopted as the Constitution and By-Laws of this Association, which shall be known by the name of the "Delaware Dental Association."

The memberships are, Active, Corresponding, and Honorary. The initiation fee of Active members to be $2, and Annual Dues, $1. The meetings are to be held monthly, and an essay upon some subject connected with dental science is to be presented. In accordance with the Constitution of the American Dental Association, delegates to that body are to be elected annually from among the Active members. An election for officers ensued, resulting as follows:—

President, Dr. S. Marshall; *Vice-President*, Dr. W. G. A. Bonwill, of Dover; *Corresponding Secretary*, Dr. S. S. Nones; *Recording Secretary*, Dr. J. P. O'Daniel; *Treasurer*, Dr. C. R. Jefferis; *Librarian*, Dr. W. D. Nolan.

The Executive Committee is composed of the following named gentlemen: Drs. Jefferis, Sanders, and Shelp.

The President, upon being conducted to the chair, made a few remarks, thanking the Association for the honor conferred on him. He stated that an organization such as that just effected had long been needed in the State, and would result in good to the profession, and serve to create between its members intimate and friendly social relations.

The names of several gentlemen were then submitted as candidates for corresponding memberships, and referred to the Executive Committee.

The following gentlemen were appointed as essayists: November, Dr. W. G. A. Bonwill, Dover; December, Dr. J. H. McQuillen, Philadelphia; January, 1864, Dr. Bing, Elkton, Maryland; February, Dr. E. Shelp,

Wilmington; March, Dr. S. S. Nones; April, Dr. J. P. O'Daniel; May, Dr. S. Marshall.

Dr. McQuillen, having been called upon for some remarks, said that some days back he had received one of the circulars, and an invitation to be present at the organization of the society; and although he could not make it convenient to leave home in time to be present at the morning session, he felt in duty bound to attend at least a portion of the meeting, and took great pleasure in congratulating the promoters of the movement on the success which had crowned their efforts. After referring to various ways in which such an organization would prove beneficial to its members and the profession at large, he said there was none more important, perhaps, than the faculty—which would be acquired by a regular attendance at meetings and participation in the debates—of thinking on one's feet, or of presenting views, whether in theory or practice, in a clear and comprehensive manner. Members thus disciplined in local societies would be able to enter upon the discussion of subjects as delegates to the American Dental Association in a manner which would reflect credit upon themselves, the organization they represent, and the national Association.

EDITORIAL.

ZINC CASTS.

Dr. C. J. Harday, of Chariton, Iowa, gives the following plan for the production of zinc casts, which he considers more perfect than those obtained by any other method: "Take plaster of Paris, two parts; coarse sand, one part; grind together in a mortar; mix with water to a proper consistence, and pour into a suitable vessel; then impress the plaster cast into the mass, and just as it begins to solidify, remove the cast; then pass a fine knitting-kneedle or wire through the sand in two or three places into the impression, so that the steam formed can pass off without agitating the metal when poured." He also speaks favorably of a plan which he has adopted of attaching a piece of gum-elastic, with a hook at the other end, to the ordinary mouth distender. After sufficient distention has been made, the hook can be fastened in the clothing of the patient, and retained with ease. J. D. W.

REVIEW OF DENTAL LITERATURE AND ART.

BY J. H. M'QUILLEN, D.D.S.,

PROFESSOR OF ANATOMY, PHYSIOLOGY, AND HYGIENE IN THE PHILADELPHIA DENTAL COLLEGE.

Osteo-Dentine in the Setting of Pivot Teeth.—It is not unusual for a root, on which a pivot tooth has been inserted, to decay around the pivot to such an extent that the walls of the cavity become so thin

that they have not sufficient strength to support a new pivot. Under such circumstances, osteo-dentine proves quite a useful material, when used in the following manner: After preparing a pivot of the proper size for the artificial tooth, and an ordinary-sized opening in a root, the decay should be thoroughly removed from the root affected, and the cavity then filled nearly even to the top with osteo-dentine in a pulpy condition; the pivot tooth should now be adjusted by forcing the portion of the pivot projecting from the tooth into the osteo-dentine. If a fair calculation has been made of the room which the pivot should occupy, the osteo-dentine will be compressed in such a manner as to bring the root and tooth in apposition without any vacant space being left. As it requires some experience to be able to determine this point, experimenting with the material on roots and pivot teeth out of the mouth will be found of decided advantage. After the tooth has been adjusted in the mouth of a patient, the parts should be kept free from moisture for about twenty minutes, and the patient then dismissed, with strict injunctions not to use the tooth for a day or so. Having tried the above plan in a case where it was a question whether it was worth while to make an effort to save the root, or extract it, I have presented a description of the various steps in the course adopted, so that others may, if they think proper, try it.

Dr. W. G. A. Bonwill, of Dover, Delaware, has made use of the same material for some time past, as a means for securing block teeth to gold, platinum, or silver plates, and has prepared a paper, descriptive of his process, for the DENTAL COSMOS. His method suggested to my mind the propriety of trying the same plan with pivot teeth.

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PAIN ATTENDING THE ERUPTION OF A DENS SAPIENTIÆ REFERRED TO AN ADJOINING TOOTH.—As an illustration that patients frequently complain of pain in a tooth, which a careful examination proves to be entirely free from the sensations attributed to it, while an adjoining tooth will be found the cause of trouble: Mr. Y., a young gentleman, aged twenty-three, called upon me a few days since, suffering under a severe attack of pain, which had lasted for several days, and which he located in a left upper first molar, the pulp of which was removed by me some six or seven years back, and the fangs and crown of the tooth then filled compactly with gold foil. On striking this tooth with the handle of an instrument, no tenderness was experienced by the patient, and a careful examination of the second molar with a delicate probe, and injecting cold water on it, proved that it was not at fault; but the adjoining wisdom tooth, which was two-thirds erupted, was found to have the portion of gum, still covering it, in a tense, although by no means engorged or painful condition. I determined to relieve the restriction by lancing freely, and removing effectually the superimposed gum. This was followed by the most favor-

able results; the pain disappearing at once, and it has not returned since. The citation of this case is not made on account of its novelty, but trusting that it may prove of assistance to some younger brother in enabling him to arrive at a correct conclusion in a similar case.

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Wood's Plastic Metallic Filling.—Some months back a letter was received by me from Dr. B. Wood, of Albany, inclosing a sample of his No. 3 Plastic Metallic Filling, and stating at the same time, "I perceive you are a little prejudiced against it, but all I have to say is, *learn to use it*, and your skill will soon prove of *value*, as well as a great gratification to you. Every dentist of ability, who has taken pains to acquire the use of it, is pleased with it, and likes it more the more he uses it, (that is, so far as I have heard from them,) and all affirm that it is 'better than anything, except gold.'

"So, my friend, waive any premature prejudice you may entertain, and give the Filling a fair and thorough trial, and you will never regret it, nor will your patients, that is, if you ever use anything but gold."

Never having expressed any opinion, pro or con, with regard to the material, I was somewhat surprised at the charge contained in the letter, and could only account for such an impression, on the part of the writer, from the fact of having republished in the Dental Cosmos an experiment made by a contributor to the *American Dental Review*, with the material out of the mouth, which seemed to prove that it was not a desirable article to use for filling teeth, on account of the elevated temperature which it was asserted, as the result of this experiment, was demanded to fuse the compound. Although a repetition of this experiment, on my part, appeared to confirm the conclusions arrived at by the experimenter, I refrained from expressing any opinion, as I desired a more varied and extended experience before making up my mind with regard to the relative merits or demerits of the article. Desiring, however, to deal fairly and justly by the material and its inventor, a communication from the *Dental Register of the West*, embodying the experience of Professor Taft in the use of the article, was republished at the same time, so that the profession might have an opportunity of seeing both sides of the question.

Since that period I have used the material, more or less, in the deciduous teeth, and in permanent teeth, which are so badly decayed that the walls of the cavity have not sufficient strength to support a gold filling; and, so far as the limited experience of a few months warrants, take pleasure in giving my testimony in favor of the article. When using the material in the mouth, none of the objectionable features manifested in the experiment referred to, with a tooth held in the hand, prevail in the slightest degree.

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THE DENTAL TIMES—OCTOBER.

The second number of this magazine has been received, and an article on *Alloys of Gold*, by Dr. E. Wildman, read with much pleasure, as it is a well-written, original, and valuable communication, embodying the personal experience of the writer on the subject. The general arrangement and typography of the magazine is good.

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PEOPLE'S DENTAL JOURNAL—JULY.

FAMILIAR CONVERSATIONS ON THE TEETH. By A. HILL, D.D.S.—The following extract is made from one of a series of articles published in a colloquial style by the writer, with the view of imparting valuable and desirable information in a manner most likely to arrest the attention and to instruct the non-professional reader.

It would of course be preferable to have the communication in the form of an essay for the pages of a professional magazine; and it is a matter of regret that one who handles his pen in such a capable manner as Dr. Hill does, should not be a more regular contributor to the literature of the profession than he has been for the past few years.

After referring to the absorption of the deciduous teeth, the conversation continues as follows:—

"A. Truly, the operations of nature are most beautiful and instructing. But is not the assistance of the dental surgeon sometimes requisite in such cases?

"B. Not when nature is unimpeded. But it so happens that there is sometimes an obstacle in her way; and this must be overcome by such assistance as the case demands, else deformity and much inconvenience may be the consequence.

"A. What kind of 'deformity' or 'inconvenience' do you allude to?

"B. I will endeavor to explain. You will bear in mind that I told you that the permanent teeth were larger than the temporary ones, and also more in number, consequently more room is required for them. Now, a corresponding enlargement or expansion of the jaw is necessary. And if there be no local or constitutional difficulty, *such* an enlargement *will* take place. And in such cases the expansion of the jaw, or alveolar ridge, as it is technically called, will be in exact proportion to the development of the teeth. But should it be otherwise, the teeth will be *crowded* and *irregular*—some passing within and some without the line of the arch—and thus the whole countenance and entire expression and appearance of the individual will be marred and injured. His articulation will be indistinct and difficult; his enunciation of language hard and uncouth; and this difficulty of speech will give rise to habits of face and expression which will continue while the person lives.

"A. Your remarks on this part of the subject remind me of what I have often witnessed in public speakers. Some of them are so hard in their manners, and their efforts at speaking so laborious, as to make a listener fairly *sweat* while in sympathy with them. And I have found myself utterly unable to account for the difficulty. In many cases it can neither be attributed to a lack of genius or education.

"B. I am happy in calling your attention to this subject, and I fearlessly challenge you to find one among them whose dental organs are perfect in their development. And I venture to say that if you will tax your memory, you will scarcely call to your recollection a single instance of a *celebrated orator* with a contracted mouth and irregular or imperfect development of the dental arch.

"A. I distinctly remember that the large and firmly expanded mouth of Henry Clay, of Kentucky, has been a subject of frequent remark. And many amusing anecdotes are related of his peculiar expression of countenance, connected with the broad expansion of his mouth, when engaged in debate.

"B. There can be no question but that Mr. Clay, the world-renowned orator, was much indebted to his dental formation, and the peculiar play of his features, for his great success in oratory. The playful smile, the biting sarcasm, the supercilious curl of the lip, the silver accents of his voice, the delightful enunciation, the elegant diction, all—all are much more dependent on a perfect and harmonious arrangement of the dental organs than a superficial observer would suppose.

"A. Volumes have been written upon the subject of elocution, and the best method of regulating the voice. Professorships have been established in our academies and colleges for the instruction of our youth; but it never occurred to me before that a skillful and scientific dentist is really more important than either in preparing the way for the teaching of this most desirable accomplishment.

"B. The education of the vocal organs is of vast importance. Vocalization, both with respect to *language* and *song*, is dependent, in a great degree, on the perfection of the dental organs. And yet parents, who expend hundreds of dollars in giving their daughters a fine *musical* education, or in preparing their sons for the profession of *law* or *theology*, grudgingly withhold, or reluctantly pay, the insignificant fee of the dentist, which is absolutely essential to achieve the end they desire.

"A. This subject certainly is interesting, even if it fail of the importance which you seem to attach to it. And I find it very suggestive of curious and interesting questions. I have often observed that fine singers fail to win the applause which they otherwise merit, simply because of *defective elocution.* And in the *clear* and *distinct* utterance of their words, they fail.

"Now, in *ballad* singers, I regard it essential that not only the sounds, but that *every word* should be so clearly enunciated as to impress the sentiment of the ballad upon the mind of the listener. And I now perceive the cause of so many failures.

"B. There is, unquestionably, a wonderful charm in simple music. But in certain forms of music, like the *ballad*, or in sacred music, the *chant*, for instance, *words* are *indispensable.* And the more distinct the utterance, the more powerful the effect upon the listener. The case is the same, whether in speech or in song. 'And how shall he that heareth say *amen*,' if the words are not understood? And how shall a man speak clearly and distinctly, whose dental organs are all irregular and defective?

"A. I am extremely obliged to you for these valuable and interesting thoughts. They are valuable, because they are useful. And I can but think how ignorant are the great mass of the community with respect to the important duties of your profession.

"B. And equally ignorant are many who attempt to practice it. I say *attempt* to practice it; for they do nothing but mutilate and spoil nature's most beautiful productions. Nor am I at all surprised that the opinion should become prevalent, that the duties of the dentist are degrading and insignificant. For if men, whose highest ambition seems to be graduated by the attainments of the '*blacksmith* and the *tinker*' in the practice of dentistry, are to mould the public mind in regard to the duties appropriate to our profession, this may well be. But we think you cannot fail to see that even in the science of dental surgery there is

'Ample scope and verge enough'

for the largest intellect.

"A. But, pray sir, would you have me understand that the resources of your art are adequate to correct the serious evils and disabilities of which you speak?

"B. Most assuredly. Precisely here the most glorious achievements of our profession have been accomplished. Malformations the most remarkable, irregularities the most striking, and defects of the most glaring kind fall within the scope of our practice, and are found amenable to proper treatment.

"A. As this matter is of much importance to the public, will you please be more specific as to the forms of irregularity and malarrangement to which you refer as being within the scope of successful treatment.

"B. First, then, I would mention a *crowded* denture, where the teeth are pressed for want of room, and irregularities consequent upon such a state of things.

"Second, what is called, in common parlance, '*jimber-jaw.*' This is where the under jaw protrudes beyond the upper and changes the whole cast of the countenance, giving to the physiognomy a false expression, and the individual a sad deformity.

"Third, cases where the *upper front teeth*, instead of standing perpendicular to the line of the face, project forward and droop down upon the under lip, standing far out, and giving an unsightly appearance to the whole expression of the face.

"Others again, both upper and under teeth, project much like the teeth of the *Simia* tribe, to which the *ape* and the *monkey* belong.

"Fourth, cases where the jaw and teeth resemble the *Rodentia* class of animals, to which class the *rat* and *squirrel* belong. Such cases are comparatively common. But we may well regard it as a very serious calamity to those who are compelled to wear through life a *sniveled-up* face of this description. And the more especially so, as we remember the fact that we are in the constant habit of estimating character by the *expression* of the *face.* Indeed, so common is this practice with us that we do it *instinctively* as it were, and we like or dislike as the face is pleasing or otherwise.

"A. I find myself more deeply interested as we proceed in these conversations, and am really surprised to find so intimate a connection between your profession and the *health*, *happiness*, *comfort*, and *personal beauty* of mankind. You have succeeded in investing it with an interest which I little thought it deserved. But I am curious to know if you can really *correct* evils of such magnitude as you have here described.

"B. *Most assuredly we can*, if an opportunity is afforded, and a reward commensurate with the services rendered is proffered to us. Let it be *most distinctly* and *emphatically* understood that in such cases as we

have named, the resources of our profession are ample and adequate, when skillfully applied, to correct and restore the *most unsightly* and *irregular* formation of the teeth and jaws.

"A. At what age can these operations be undertaken with the greatest promise of success?

"B. Any time from eight to twenty years. But perhaps the most propitious period for such operations is from the age of ten years to sixteen or eighteen. During the process of *ossification* or hardening of the bones, and the gradual development of the system, the parts yield more easily, and can be moulded to the required form with far more certainty and convenience than at a later period.

"A. Can this be accomplished after the age of twenty-one years?

"B. Yes, but with much more difficulty—that is to say, *much* can be accomplished in this direction after this period; *but not all* that might have been done, if they had been taken 'when the bones were in their gristle.'

"A. It seems to me that the subject of correcting *irregularities* and *deformities* of the teeth and face is one of great importance, and should be known to the public. For I am sure there are thousands of parents, who, having means abundant at their command, would be willing to pay large sums if *such* payments could command *such* services, and confer such unmistakable blessings upon their children. But they generally suppose that *extracting*, *filling*, and *cleaning*, together with inserting artificial teeth, embraces the whole resources of your profession.

"B. Nor am I surprised that they should entertain those views, when there are so many who emblazon their names to the world as '*Dentists*,' do so much by their actions to confirm such opinions. Nevertheless, we do not exaggerate the value of these high professional services when we say that they are among the noblest and most beneficent achievements of physiological science, and that they crown the profession of surgery with as pure a radiance as the successful amputation of a limb, or the removal of a tumor.

"No one can estimate the priceless benefits conferred upon a young gentleman or lady, by the restoration of the normal expression of the face, and the beautiful and harmonious play of their features, subsequent to such operations.

"A. I am fast coming to the conclusion that no *pearls* are so *beautiful*, no ornaments of jewelry so desirable, as the brilliant pearls which nature sets between the well-moulded lips of a young lady or gentleman, relieved by that delicate carmine which tints the lip and gum, while a sweet smile plays over the face.

"B. If we could but awaken public attention to the facts and principles herein referred to, one great object, and I might say the *principal* object in the publication of the *People's Dental Journal*, would be fully realized. For I take it that the great design in the publication of this journal, is the diffusion of *important* information, in an *attractive* and *popular* form, upon the subject of dental science and practice. And how far it shall be successful, will depend greatly upon the interest which *you* and others may manifest in the enterprise.

"Let me commend it to your confidence and patronage as the *only* publication of the kind with which I am acquainted.

"Hoping to resume our conversations in the next number, and to perpetuate the interest you have hitherto expressed, I take my leave for the present."

PERISCOPE OF MEDICAL AND GENERAL SCIENCE IN THEIR RELATIONS TO DENTISTRY.

BY GEO. J. ZIEGLER, M.D.

"*On the Formation of Mucus and Pus.* Delivered before the President and Fellows of the Royal College of Physicians in Lent, 1863. By THOMAS K. CHAMBERS, M.D., Hon. Physician to H.R.H. the Prince of Wales, Physician to St. Mary's and the Lock Hospitals, etc.

"*Mr. President,*—The subject which I have chosen for these Lumleian Lectures is one which in a paramount degree must be interesting to physicians above all other observers of nature. A physiological Fellow of our College was in the habit of reckoning his patients as so many 'mucous membranes.' On his retirement from active practice he said, 'I have taken my last fee from my last mucous membrane.' I do not think his term was an exaggeration, for in very few indeed of the cases administered to by us has not either the cause of the death acted on the body through these integumentary coverings, or manifested its action by a perversion of their functions. A great majority of our drugs are intended to act on mucous membrane, and all are introduced into the body through it. We cannot therefore but be grateful to those who have endeavored to add to our knowledge of its nature and habits.

"The term by which it is conventionally designated is apt to lead the most thoughtful of us into a fallacy. Active members of society are named after the work which is their most important occupation. The industry of the lawyer is the administration of the 'law;' the doctor is most efficient when he is most 'learned;' the duty of bishops and overseers is ἐπισκοπεῖν, 'to oversee' each their several departments. But the office of mucous membrane is *not* to secrete mucus. It is most active when it is not doing so, and its activity is decreased just in proportion to the copiousness of the mucus. Typical health certainly consists in its absence; many robust people pass weeks without expectorating; many find their handkerchiefs clean and unrumpled after being days in their pockets, in spite of all the artificial and accidental irritants to which the Schneiderian membrane is subject; and the urinary and intestinal canals contribute only an infinitesimal quantity, which may fairly be attributed to a temporary departure from health of some fraction of their large area.

"The business of mucous membrane is to offer a passage for oxygen, water, fat, albumen, and other nutrimentary substances, and to defend the less easily renewed tissues beneath it from the deleterious action of external agents. These functions it best fulfills when it is bedewed with a moderate watery exhalation, and not with mucus.

"This exhalation is transparent and watery, and possesses nothing of that stringy adherent character by which we ordinarily recognize the substance known as mucus. It carries out with it the epithelium scales shed or moulted from the surface; and these scales are consequently found in the excretions; but it is itself absorbed again as quickly as it is exhaled, and does not contribute to the substance of any of the ejecta of the body. The typical healthy condition of a mucous membrane may be considered to be a constant dampness without visible fluid, and a moderate and gradual shedding of epithelium.

"Shed epithelia are found also in mucus, but not as a peculiar characteristic, nor modifying its physical properties. Its most obvious characteristic is the presence of transparent bodies, apparently of a gelatinous consistence, of a more or less rounded or oval form, and with one or more nuclei, seemingly of a less transparent consistence, in their interior. But its physical properties of consistence and adhesiveness, which so peculiarly distinguish it from all other transparent fluids, seem to be derived from the medium in which these globules are placed. It seems to be so derived because similar globules, quite undistinguishable in appearance and behavior, constitute also the bulk of pus, a fluid of quite distinct attributes and properties.

"There are probably no observations more suggestive and luciferous to rational medicine than those contained in the paper of Henle published about a quarter of a century ago in Hufeland's Journal. It is an excellent example of physiological reasoning, and later observation seems to set the matters of which it deals beyond reasonable doubt.

"Professor Henle's argument aims, successfully I think, at tracing the globules which are seen in mucus under the microscope to that substance which in the normal state of typical perfection would form epithelium. They appear to be young epithelium, arrested in its growth, and prematurely moulted off from the body. The condition which produces them is an arrest of development.

"To feel the full force of the experiments and observations which confirm this view, it is necessary to see the connecting links of resemblance which run through the course of the integumentary membranes. We must pass over for the nonce the differences which fit for their various uses the external skin, the covering of the tongue and mouth, the secreting lining of the stomach, the absorbing lining of the intestines, the defensive coats of the bladder, urethra, rectum, etc. We must look upon them as one whole. Just as the skin clothes the muscular framework of the body, moulded on the form of the skeleton, so the mucous membrane lines the internal canals, pits, and galleries, following their intricate windings throughout. And for exactly the same purpose—namely, to be a defensive medium of communication between the individual being and the outer world, between the microcosm and the megalocosm, in all their chemical and mechanical relations to one another.

"For the fulfillment of this common duty they have a common structure. Strip off a piece of epidermis, and you find that its outermost layer consists of flat polygonal scales pressed close together and united both by the edges and surface so as to form a continuous leathery tissue. They are welded into one fabric like the exposed part of an old macadamized road. But just as, when you pick up the surface of this road, you expose a deeper layer of stones loose and separate, so beneath the scarf skin you find what Malpighi, with philosophical prescience, called the *rete mucosum*. This consists, like the scarf skin, of separate corpuscles, which, like the stones of the macadamized road, become looser in structure, less adherent, and less similar to the upper layers as you go deeper. The superior corpuscles are, indeed, flattened, and exhibit a flattened nucleus inclosed in a clear cell as an epidermoid scale. But as you get nearer the cutis the nuclei are rounder and rounder, and the transparent area of the cell is less and less visible; until at last, on the cutis, the corpuscles are seen to consist of only granular masses. These granular masses are identical with those seen in mucus.

"Just in the same way the mucous membranes are clothed with epithelium, loosely scaly in some parts, welded together like a macadamized pavement in another, columnar in another. And when this is stripped off or injured, there are brought into view floating granular masses of various sizes, which constitute what are familiarly known as 'mucous globules.' They are exactly identical with the inner strata of the epidermis, the *rete mucosum* of Malpighi.

"What are these globules? Are they something special, belonging to special tissues, and appearing only under special circumstances? Or are they a form of organic matter common to other parts also. Are we to apply here the Baconian myth of Proteus, and look for their *natura naturans* as exhibited elsewhere in various shapes? I think it is philosophical to do so.

"The appearance they have is that of all matter when it first puts on life. The telescope and the microscope equally reveal to us these nebulæ as the earliest indication of vitality, drawing the surrounding chaos toward a central point, then exhibiting that central point as a kernel or nucleus. And then this kernel becomes the parent of new centres, individual and separate, and these again starting places of new action. The dawn of vitality is exhibited in the coalescence of molecules of organic matter so as to form nuclei, which, under favorable circumstances, develop either separate cells or tissues.

"Up to this point each focus of life seems to be a separate individual. It takes in nourishment by its innate power from without; it increases in size and alters in shape. And this alteration in shape seems principally to take place from within. It is not merely an aggregation outside of new molecules, but a plastic change of internal appearance. Nay more, it possesses the faculty of giving birth to an individual, and so to a succession of individuals, like itself. No better evidence of automatic existence can probably be given.

"These phenomena can be seen without much difficulty in the globules of mucus. That which answers best is what we often expectorate in little semi-transparent gelatinous lumps from the bronchi in the morning after exposure to night air. This must not be mixed with water, or be allowed to cool, but kept at the temperature of the body, and put immediately under a lens of as high a power as you can command. Dr. Beale showed me the phenomena first under a 24th, but I have seen them very well under an 8th inch in an old-fashioned Powell's microscope. Keep your eye fixed on one nuclear mass, and you will often see a gradual change in its appearance. First a clearer nucleus appears in it; then, as you gaze, two, three, or more smaller nuclei. Then the fine granular specks in its sides coalesce into a nucleus. Then you see that it has a bulge in its side, and that a nucleus forms a bud, and then has a constricted neck or stalk. And then, perhaps, if you are lucky enough to get the mucus in motion without losing sight of your object, the bud may float off as a separate globule. Or the whole globule may divide into two, each with a separate nucleus.

"A temperature below that of the body seems to check this development, but you may often keep it on by means of a spirit-lamp. The globules in which I have seen it take place are those from the trachea, from the os uteri, and from warm freshly-passed urine in cases of inflamed bladder.

"When the fluid has got dried up by the heat thus constantly applied,

you may in some degree restore its activity by moistening it with a viscid animal fluid, such as saliva. The greater part, indeed, is broken up into molecules, and these show no disposition to unite into globules, but among them will remain some globules unbroken, and these will again form new nuclei, and bud as they did at first.

"Is this organic growth? Or is it the aggregation into visible masses of particles already existing, like that which Mr. Rainey has described as taking place in mineral matters? Is it a mere coalescence, or something more? I must say that to my mind the production of an individual like itself, capable again of reproducing another individual still resembling the grandmother globule, is identical with organization. And I think, too, that the multiplication of the nuclei inside is quite unlike any sort of coalescence, which would add matter to the outside, like an urinary calculus or an avalanche.

"It seems to me that each of the globules contains a centre of life, into which the pabulum passes from the outside, nourishing them and giving them means to increase in number. This would account for the enormously rapid collection of mucus filled with globules on inflamed membranes, even on membranes which in the healthy state shed very little epithelium, or have but one layer of it, as in the bronchi, and therefore cannot be supposed naturally to form much young epithelium. The first parent globules may be aborted young epithelium cells, and these may be the ancestors of others which form the bulk of the mucus, begetting them with the extreme rapidity characteristic of generation in low organic life.

"If this be true, mucus may be viewed as a parasite, receiving from the body its nutriment indeed, but not its form nor its claim to vitality.

"Doubtless the growth of mucus is most rapid where there is normally a thick layer of epithelium, and where a large growth of young epithelium is constantly being formed to replace the rapid moulting. But still it is much quicker on localities with a thin layer than could be accounted for by each globule being an aborted scale; there could not be enough aborted scales to furnish so much mucus so full of globules. I believe, therefore, that it grows on the surface by their budding and splitting in continuous succession.

"If you compare pus which has been some time accumulating on the surface of a mucous membrane with that which is being freshly formed, you will remark a decided difference in the globules they contain. Take some accessible mucous surface—the eye, or the vagina, for example—thickly covered with opaque secretion, and you will find the globules nearly all of a size, even and spherical. Then wash it clean with cold water, and examine the first formed secretion: the globules are of all sizes and of irregular shapes, oval, bulging, budding, with or without nuclei. This seems to indicate a general change of form by time—a certain completion of creation in that which has been longest formed.

"When we see, as I have described, the globules of mucus budding, dividing, and subdividing in active haste—new foci of independent vitality generated and multiplying even when separated from the body—it might appear that a local increase of life was being exhibited. Certainly a greater bulk of living substance is formed by a membrane secreting mucus or pus, than is the case in the healthy state; for the secretion outweighs by a hundredfold the daily quantity of epithelium which its original material was destined to make. But what sort or degree of life is exhibited

by this secretion? Is rapidity of multiplication to be looked upon as evidence for or against force of vitality? Against, I think. The lower we go in the scale of creation, the more quickly and the more copiously do the living forms representing the various classes reproduce their kind. The less functions and force and intensity of existence they have, the more prominent becomes reproduction as the main object of their being created. This seems to be the universal rule, to be traced all through living beings till we get down to the Amœba and the mould, in which no trace of a function can be detected beyond the multiplication of their simple substance.

"Here, indeed, it becomes difficult to draw the line between organic and inorganic. Instead of being in contrast and in conflict with the physical forces of inanimate nature, vitality seems to obey laws which closely resemble them. The main point of distinction seems to be the growing from a centre outward of organic, and the aggregation toward a centre of inorganic individuals.

"When organic matter destined to form part of an animal has attained the end of so becoming a member of a consistent whole, it ceases to multiply itself. Cells do not normally go on splitting up and producing cells similar to themselves in situ. The highest development of their vitality is ceasing to exist as growing matter. A fully-formed epithelium scale does not produce another scale, nor the nucleus of a muscular fibre another nucleus. The retention of reproductive force is an expression of the lower and an exclusion from the higher functions of life.

"In the mucous globule, then, we find organic matter, whose destination was the formation of epithelium, arrested in its development when it has attained only the lowest degree of life—that lowest degree of life being the function of reproduction."—(*Lancet.*)

"*Case of Epithelioma of the Mucous Membrane of the Mouth.* Under the care of Mr. Birkett, Guy's Hospital.—The notes of the following case have been furnished by Mr. Thos. Robt. Nason:—

"William S., aged sixty-one, a gardener, residing at Clapham, applied for admission on February 10th, under the following circumstances: He states that about fifteen months since he felt a small tumor about the size of a pea on the right side of the roof of the mouth opposite the second canine tooth; this has gradually spread and involved a part of the mouth, taking on the character of epithelioma. He has been under no treatment, but, finding that it gradually got worse, he applied at the hospital.

"The patient is a tall, thin, pale-faced man, but with healthy appearance. On examination, the growth, evidently epithelioma, was found completely filling the arch of the palate. After a week's rest to recruit his general health and accustom him to the confinement, on February 17th Mr. Birkett, after having removed four or five teeth, under the influence of chloroform, carefully dissected it off *en masse* very neatly, and with very little hæmorrhage. He has gone on well without a single bad symptom. On the 18th he passed a quiet night. On the 19th and 20th he still continued well; and on the 21st, there being no further necessity for having him under constant surveillance, he left the hospital, comparatively speaking, cured. He was to remain for some time, however, under observation.

"The great points to be noticed in this case are, that the operation

about the mouth was carried on under chloroform, and that there was very slight hæmorrhage attending it."—(*Ibid.*)

"*Velocity of Nervous Force.*—The *Veterinarian* states that by the aid of a chronoscope M. Hirsch has come to the conclusion that nerves transmit their impressions at the rate of thirty-four metres a second. M. Heinholtz estimates the velocity at 190 feet per second, but his experiments were performed on the motor nerves of a frog, and those of M. Hirsch on the sensitive nerves of a man."—(*Ibid.*)

"*On the Influence of Sex in Hereditary Disease.* By William Sedgwick.—In any inquiry respecting the influence of sex in hereditary disease, the cases to be referred to must necessarily be very varied and very numerous; and it has therefore appeared to be a good plan to select for consideration those chiefly which admit of being grouped together in some natural order, so as to avoid the confusion which would result from citing a large number of cases having no common bond of union derivable either from the nature or the seat of the disease itself. With this object in view, it was thought desirable, in the introductory paper on this subject, to refer chiefly to those diseases and peculiarities which affect hereditarily the skin and its dependencies, in which the principle of sexual limitation appears to be particularly well marked. It is proposed to follow out, to some extent, the same plan now, by citing in the first instance some corroborative cases belonging to the large group already referred to, and then proceeding to illustrate the subject by such additional cases as admit of being referred to some anatomical division of the body, such as the upper and the lower extremities; to some physiological division, such as the cerebral, circulatory, and respiratory systems; and lastly, to notice briefly such other cases as may not have been included under the preceding heads.

"Subsequent research has tended to confirm the opinion which was advanced in the paper already referred to, that sexual limitation, although met with in all forms of hereditary disease, is more constant and more strongly defined in those diseases affecting hereditarily the skin and its dependencies than in those affecting the other organs or tissues of the body; and in thus drawing attention to sexual limitation as more frequent in the hereditary affections of these structures than in those of internal parts, it must not be supposed that there is anything unexpected in its occurrence under these circumstances; for it might be inferred from analogy that if such restriction by sex was a characteristic phenomenon in disease, it would be especially so in connection with the skin and its appendages, which naturally present peculiarities dependent on sex which we fail generally to recognize in the structure of internal organs; and in many of the lower animals, as, for example, in the plumage of birds, and in the external structures of insects and other invertebrate animals, the contrast is so great that naturalists have often by mistake referred the external and hereditary distinctions of sex to difference of species. * *

"In cases of hereditary absence of hair, it is necessary to distinguish between those in which its development would be naturally limited to one sex, and those in which the hair is shared by both sexes alike. For example, in the justly celebrated story of Burnt Njal, the tragic occurrence, from which it derives its name, resulted from the feuds occasioned by Njal himself, nicknamed the 'Beardless Carle,' and his three sons, Skarphe-

dinn, Grim, and Helgi, being taunted with their want of beard; and this hereditary absence of hair, peculiar to one sex, is well known to characterize certain races of men, such as the North American Indians of the present day. As these cases could not be otherwise than limited to one sex, they are only indirectly connected with our subject by the fact of being hereditary. But there are many cases on record, in which the absence of hair common to both sexes is hereditarily limited to one. In the case of a man at the late hospital of La Charité, in Paris, observed by M. Rayer, there was congenital deficiency of hair, so that the cranium appeared completely naked; 'his mother and both his sisters had fine heads of hair, while his father presented the same defect in regard to the hair which he did himself.' Danz relates the case of a Jewish family in his neighborhood, in which two adult sons neither have nor ever have had hair or teeth. In these cases it will be noticed that the baldness was both hereditary and congenital; but in the following cases the peculiarity was developed at a definite period after birth, showing, as often happens in hereditary affections, the associated influence of sex and age. The first is a case observed by Dr. Burgess, in which the baldness affected two brothers very early in life. 'A young gentleman, eight years old, was brought to me,' says Dr. Burgess, 'on the 4th of February, 1854, by his parents, with a shining scalp, as seen in old men, without a vestige of hair on it, denuded of eyebrows and eyelashes, and without hair on any part of the body. This boy had the usual supply of hair until he was four years old. The hair then began to fall gradually, until it totally disappeared.' * * * 'His brother, two years younger, began to lose his hair in detached places. His sisters, younger and older, have a good supply of hair, as have also his parents who brought him to me.' In a case recorded by Poilroux, three brothers became bald at the age of twenty-five years, and an uncle in their family had experienced the same loss at the same age. In a somewhat similar case, referred to by Prosper Lucas, all the sons became bald like the above at the age of twenty-five years, while the daughters preserved their hair. In the following case, related by Dr. Thurnam, the baldness was congenital, but less complete than in the cases previously referred to. 'A gentleman, aged fifty-eight, had been distinguished throughout life by the almost complete absence of hair, by the teeth being not more than four in number, by the delicate structure of the skin, and by the absence of sensible perspiration and tears. A cousin-german on the mother's side, who was born only a year or two before the subject of the preceding case, presented almost precisely the same peculiarities.'

"With respect to the preceding case, it is to be noticed that the association of peculiarities of the hair and teeth in the same individual is not uncommon; for it occurred also in Danz's case of hereditary absence of hair and teeth; and it is well known that a renewal of the hair in old age, of which there are many examples on record, is usually accompanied by a renewal of the teeth. The hereditary peculiarities of the teeth may therefore be conveniently considered after those of the hair. Some years since, I became acquainted with the case of a gentleman abroad who had never had any teeth, and whose children inherited the same defect; but I did not secure a complete history of the case. Otto refers to a case in which all the teeth were wanting in two brothers; while, on the other side, Dr. Jacobi, of New York, cites a case in which three sisters were born with central incisor teeth. Deficiency of particular teeth has been occasionally noticed; and, according to Dr. Mason Good, 'the absence of

some of the teeth, such as the bicuspids, is not uncommon;' but he considers that 'it occurs more frequently in the incisors of the lower jaw; and Mr. Fox (he goes on to inform us) refers to an instance in which this defect appertained to several individuals of the same family, none of whom had ever cut incisors of the lower jaw.' One of the most curious cases of hereditary peculiarity of the teeth is the following, for which I am indebted to Dr. Cotton, and which affords a good illustration of atavism in connection with the influence of sex. A gentleman had, with both dentitions, a double tooth in place of the left second incisor in the upper jaw; he was the only one in a family of nine children who presented this peculiarity, which he inherited from his paternal grandfather, whom he so exactly resembled, even in the form of the hands also, as often to have arrested the attention of their acquaintance. The influence of sex has been observed also in peculiarities affecting the color of the teeth; for Professor Heider, of Vienna, has related a case in which teeth of a rose-red color occurred in twins, the daughters of Italian parents; both the first and second dentition were marked by this peculiarity. So likewise the hereditary tendency to caries of the teeth and toothache is sometimes limited, in a very decided manner, to one sex, as in the following case which occurred in my own practice, and in which complete limitation to one sex occurred for three generations: Mrs. A., under the age of forty years, and the mother of seven children, has not had for many years a sound tooth, the decay having begun very early in life; she has no brothers, but there are three sisters younger than herself, whose teeth are in a similar state, and in all of whom the decay commenced at a very early age; their mother was similarly affected in the teeth, and, like her four daughters, was a 'martyr to the toothache.' Of Mrs. A.'s seven children, five are girls, in four of whom, aged respectively sixteen, twelve, nine, and seven years, the teeth began to decay at the age of two years or soon afterward; in the youngest girl, aged two years and a quarter, the teeth are not decayed, but the dentition has been difficult. Of the two boys, the third and fifth children in the order of birth, one died at the age of three years, and the other has attained the age of four years without any decay in their teeth. The father of these children had sound teeth. Of Mrs. A.'s three sisters, the eldest has four children: two boys, aged fifteen and five years, with sound teeth; and two girls, aged thirteen and three years, with decayed teeth. The two other sisters of Mrs. A. have no children.

"From special affections of the teeth, we might readily pass to those of the eyes; for so intimate is the connection which exists between the skin and its superadded structures that peculiarities or defects of two or more parts are frequently associated in the same case; and as regards the teeth and eyes, Mr. White Cooper goes so far as to state that, in all cases of double microphthalmia brought under his notice, he has at the same time met with defective development of the dental system. Before, however, leaving the mouth, it will be useful to notice some cases of hereditary hare-lip limited in like manner by sex, some of which are also associated with lachrymal affections, and may therefore appropriately precede the consideration of special defects of the eye hereditarily limited to one sex. M. Demarquay, in a paper on hare-lip, published in 1845, called particular attention to the influence of hereditariness in the production of this deformity; and from among the cases he has recorded may be cited that of Eliza Dif, affected with double hare-lip, whose mother had simple hare-

lip. In another case, a carpenter and his son were affected with hare-lip; in another, a mother and her daughter were similarly affected; and lastly, in the case of a young man operated on by M. Thierry for this deformity, it was ascertained that the father had been previously operated on for the same by M. Desault. In the case of a boy with simple hare-lip, operated on by M. Roux, a brother had been previously operated on for double hare-lip. In another case of M. Roux's, of a father and son with six fingers on each hand, and six toes on each foot, there was also double hare-lip in both. M. Roux used to cite, in his clinical lectures, the case of a peasant of Seine and Oise, on whom he had operated for a double hare-lip, and who was at the same time affected with ectropium of the two superior eyelids; his son presented exactly the same departure from nature. The atavic inheritance of the defect is also shown in the following case quoted by Prosper Lucas: 'A man well formed, among the parents of whom were found two attacked with hare-lip, had by a first wife eleven children, two of whom had hare-lip; and by a second wife, two who were affected with the same deformity.'"—(*Brit. and For. Med.-Chir. Rev.* and *Dublin Medical Press.*)

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"'*Red Vulcanite' in Dentistry.* By EDWARD WELLS, M.D., F.R.C.P., Reading.—Rev. Mr. C. being, as he considered, in perfect health, went about six weeks back to a dentist in London, who fitted him with a frame containing upper and lower teeth. Immediately upon wearing them, he found a metallic taste in his mouth, which was very disagreeable. By degrees his health began to fail; he became weak and nervous, lost his appetite, and began to emaciate; had flatulency, fetid breath, and looseness of bowels. After wearing the teeth for six weeks, he became convinced that they were the cause of his ailments; that he was, in fact, being slowly poisoned.

"This led him to send for me. I found him suffering from nervous prostration. Pulse 100, weak; tongue coated with a white film; the urine was whey-like, having an extremely fetid odor, faintly acid; specific gravity 1009, slightly albuminous on boiling.

"On examining the teeth, which are exhibited, the basis is found to be what is termed 'red vulcanite,' a composition, as I learn, of vermilion, sulphur, and India-rubber, vulcanized. This composition, therefore, contains the red sulphuret of mercury, probably to some amount, as the color is entirely due to that salt.

"Now, as the 'red vulcanite' is largely used in dentistry, it is possible that it may not so rapidly affect many persons as it did my patient; for Mr. C. is peculiarly sensitive to the action of mercury. When ill, he is never able to take the least mercurial medicine without experiencing its toxic effects. This is probably due to his being predisposed to an affection of the kidneys. He was therefore peculiarly susceptible of the poisonous effects of the vermilion contained in the basis: and, from the condition of the urine, I think there is no doubt he was suffering from the injurious impression made by the mercury on the urinary organs. It is not improbable that there may have already existed some disease of the kidney in a latent form, which has been called into action by the absorption of the mineral. Such an explanation of his symptoms, however, would not render the use of such a basis—in his case, at least, as well as in many others—a whit the less objectionable.

"In the short time that has elapsed since leaving off the teeth, he has

become gradually better and stronger. The urine is much less fetid; the appetite has improved; and the tongue is cleaner. The improvement has been sufficient to leave him still fully convinced that the teeth were the cause of his illness.

"I have ventured to bring this case before you, as in consequence of its great adaptability to the mouth, the 'red vulcanite' is largely used, and it is possible you may be called to cases in which it is acting injuriously on the system, but in which the patient has failed to discover the cause, and in which it may fall upon the medical attendant to diagnose the *causa mali.*

"P.S.—The urine has since risen to specific gravity 1020."—(*Brit. Med. Jour.* and *Dub. Med. Press.*)

Primary Organic Form.—"So far from a cell being the 'primary, simplest, or most elementary form,' either animal or vegetable, it is certain that, passing by the state of solution in which organic matter exists in fluid fibrin, there are in it, or in other fluids or soft matters, under certain conditions, numberless molecules concerning which we have been for years insisting that they must be intimately if not fundamentally connected with growth and nutrition; while fibres may be unquestionably earlier and more simple forms than cells. In fact, nearly a quarter of a century has elapsed since it was proved that the formation of the fibrils in fibrin is such an immediate result of its coagulation, as to be utterly irreconcilable with the cell theory. At that time, and for years afterward, this objection to the catholic doctrine was either quite disregarded or deemed heretical; but every successive addition to our knowledge has only tended to confirm the conclusion, that primordial fibres are often formed before and quite independently of the agency of any cells whatever. And what (so long since displayed also in this country) are the minute, equal-sized, or primary molecules composing the molecular base of animal chyle and vegetable latex, or the larger unequal-sized or secondary molecules in the same fluids, in the juice of the thymus and lymphatic glands, in the blood of young animals during the height of digestion, in the suprarenal glands, and in the semen just before its perfection? What are the like molecules in formative, germinal, or histogenetic matter, at the growing-point, throughout organized nature? What are the globules of milk? All certainly examples of organic matter in a more simple or elementary form than that of cells. Indeed an eminent zoologist, of whose system the cell doctrine forms the foundation, has actually elevated such molecules, especially the globules of milk, to the rank of independent animals, and instituted for their reception his order Endocystica."—(*Extract from Hunterian Oration by* Dr. Geo. Gulliver.—*Dublin Med. Press.*)

"*Organic Cells.*—Dr. Arlidge has published in *Annals of Natural History* a paper on the Development of the Organic Cell, by Karsten, translated from *Poggendorf's Annalen.* Among other statements, we find that 'the cell wall is not simple, but composed of several cells placed one within the other, which are frequently regenerated from within outward by the unfolding of the nuclear cell, and each of which cells passes through a course of development peculiar to itself. * * * * The so-called nucleus is a nuclear cell. * * * * The so-called constrictions or segmentations of the cell-nucleus belong in fact to the same category as the so termed germinating cells. These forms are produced

by the excessive development of daughter cells in a fully vegetating parent cell which is in course of destruction. * * * * The rotation of the cell juices appears to be a mere phenomenon of diffusion—endosmosis co-operating on the one hand, and the property of assimilation possessed by the inclosing cell wall on the other, in a continuous act of intermingling the materials concerned.'"—(*Intellectual Observer.*)

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"*Nerve Cells.*—MR. BEALE's researches lead to the conclusion: '1. That in all cases nerve fibres are in bodily connection with the cell or cells which influence them, and this from the earliest period of their formation. 2. That there are no apolar cells, and no unipolar cells in any part of any nervous system. 3. That every nerve cell, central or peripheral, has at least two fibres connected with it.'"—(*Proceedings of the Royal Society.*—*Ibid.*)

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"*Spontaneous Salivation—A Suggestion.*—By JOSEPH A. PETERS, M.D. A good deal having been said in the medical journals, as well as in the newspapers, regarding the abuse of mercury by the medical officers of the army, and especially since the late order of the Surgeon-General on the subject, it has struck me that perhaps many cases have been reported of mercurial ptyalism which were in reality cases of spontaneous salivation. This is mentioned as an idiopathic affection by medical authors, but I believe is somewhat rare. While serving with the Twenty-first Regiment in August, 1862, I met several cases, and as they served to prove to me at least, that the disease was not a myth, and that it might exist in the army, I am inclined to the belief that it may have often been mistaken for the mercurial affection. I regret that I cannot give a detailed history of the cases, but perhaps such a brief account of them as I can give from memory may not be uninteresting to those who are discussing the question.

"In August, 1862, while we were encamped on the since celebrated 'Maryland Heights,' near Fredericksburg, I discovered symptoms of severe salivation in a patient in the regimental hospital; as I had been giving him some calomel I of course attributed it to that, and such was the view taken of it by Surgeon Wilcox, (then chief surgeon of the brigade,) at his visit of inspection, where he saw the case. My only difficulty was to account for so severe symptoms from such a small quantity of the drug as he had taken. A few days later I found the same affection in a man who had taken no mercurial at all. I cannot now recall the precise number of cases which occurred, but think there were about half a dozen, some of whom had and some had not taken calomel, or *pill hydrargyri*, but none of whom had been subjected to a 'mercurial course,' or had taken more than a very small amount of the remedy. As all the patients were well known to me from long association, I felt sure that, unless in the first case, there could be no such idiosyncrasy as sometimes exists and renders even a small amount of mercury a poison, so I put mercury out of the question, even in the cases of those who had taken it; in the cases of those who had not, there could of course be no doubt. Nor was there, I think, any mistake in the diagnosis; it seemed very clear to both Surgeon Wilcox and myself.

"Of the causes of this disease I can say but little, and have no theory to offer. Fevers of various grades, and affections of the alimentary canal, were prevalent, from the effects of the season and other causes. I believe

no case occurred of a man otherwise healthy, being affected with ptyalism, nor could we trace it to any drug, though many of the list are accused of causing it. Scurvy was also quite out of the question, as the men were well nourished, and there were no signs of it. As to treatment, we found a gargle of brandy and water most effectual, though other plans were tried.

"If it were generally known that salivation is not always a sign of overdosing by mercury, much of the obloquy heaped upon medical officers might perhaps be averted."—(*Buffalo Med. and Surg. Journ.*)

Chloroformization.—"MR. LISTER'S observations have led him to form decided opinions on many points connected with the administration and mode of operation of chloroform widely different from those usually held in the profession. He points out that chloroform, by its primary action on the cerebro-spinal centre, is the great antagonist to shock. He therefore believes, and advances strong reasons for the belief, that many deaths which have happened suddenly at the commencement of operations have been improperly set down as deaths from chloroform, and might, on the contrary, have been prevented by the full action of this powerful narcotic. While admitting that some few deaths may have been due to fear of the chloroform itself, (which, indeed, it would be difficult to doubt,) he ascribes the great majority to an overdose of the anæsthetic from careless administration. He also proves, by some well-contrived experiments, that there is no better mode of giving it than on a folded cloth; having ascertained that 'so far from the amount of chloroform given off from the cloth being in dangerous proportion to the air inhaled, the whole quantity which evaporates from the under surface, even when the rate is most rapid, viz., just after the liquid has been poured upon it, is below Dr. Snow's limit of perfect security against primary failure of the heart.'"—(*Medical Times and Gazette.*)

Microscopical Investigation.—"One word of advice to those who by-and-by intend entering to regular medical studies. Familiarize yourselves with the use of the microscope, and in preserving the objects which you have examined. You want only a little glycerin, dilute acetic acid, and creosote water for preservative fluids, and then, with the help of a fragment of thin glass and a little Brunswick black, you may seal the object under examination upon a glass slide, and keep it by you for reference. You soon come to learn which preservative fluid suits best. The object to be attained is an air-tight cell. Do not be over careful about appearances at first; neatness will attend experience. If you do not so far master the instrument before attendance upon lectures is begun, there will be no time for learning to do so during your studentship. You will doubtless be then anxious to examine the tissues as you read up their description, but you may find that your inexperience in the use of the instrument causes the expenditure of more time than you can afford, and the microscope is put by until, as you say, 'I have more time at my disposal.' But the little difficulties which you were unable to overcome in your busy moments grow by lapse of time to such an imaginary bulk as may, perhaps, ever after discourage you from resuming the use of an instrument which, in experienced hands, remains a fund of inexhaustible pleasure and instruction."—(*Ibid.*)

"*Pancoast's Styptic.*—C. C. JEWETT, Surg. 16th Mass. Vols., reports to the Surg.-Gen. of Mass. that Pancoast's Styptic was found preferable to the persulphate of iron in many of the minor cases of hæmorrhage, inasmuch as it leaves the surface of the stump in a healthy condition, and does not produce the thick incrustation so often objectionable after the application of the iron. He does not attempt to give the *rationale* of its operation, but gives the formula from the recipe of Dr. Brinton, Surg. of Vols., and Lecturer on Surgery in the Washington Military College, viz.: ℞. Carbonate of Potash, ʒj; Castile Soap, ʒij; Alcohol, ℥iv. M.

"The good effects of this styptic were peculiarly noticed in a case of hæmorrhage occurring fourteen days after amputation at the shoulder-joint, probably from one of the acromion branches. Slight pressure on the subclavian for a short time and this styptic were perfectly successful."—(*Chicago Med. Journ.*)

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"*On Phenic Acid—its Action on Vegetables, Animals, Ferments, Poisons, Virus, Miasmas, and its Applications to Hygiene, to Therapeutics, and to the Anatomical and Industrial Sciences.* By M. LE DOCTEUR JULES LEMAIRE. *Le Moniteur Scientifique,* vol. iv. p. 649, and *passim.*—As the subject treated of in these papers is of considerable practical importance, we shall present our readers with a short abstract of them.

"Phenic acid ($C_{12}H_6O,HO$) was discovered in 1834 by Runge, who has given it the name of carbolic acid. Laurent, who studied this body, and described many of its combinations, designates it under the name of phenic and hydrate of phenyle, because he objects to place it among the acids. Gerhardt gave it the name of phenol. It has also received the names of phenic alcohol, of spyrol, and of salicone. [In this country the acid is best known in trade as carbolic acid.]

"It has been formed synthetically by M. Berthelot, by passing alcoholic or acetic acid vapors through a porcelain tube heated to redness. The acid is also obtained in the dry distillation of benzoin, quinic acid, the resin of xanthorrea hastilis, castoreum, and chromate of pelosine. Gerhardt has obtained it from salicylic acid by the action of lime or baryta. Stædeler has found that the urine of man, the horse, and cow contain it in quantities easily perceivable. It exists also in commercial creosote;* but it is from the oil from gas tar, which contains it in considerable quantity, that it is obtained.

"*Preparation.*—The oil from coal tar is submitted to fractional distillation. The part which passes over between 160° and 190° is treated with a solution of hot saturated caustic potash and some powdered potash. A mass of crystals is thus obtained, which may be separated by decantation of the fluid.

"When this mass is dissolved in water the solution separates into two layers, one light and oily, the other heavy and watery. The latter is separated and treated with hydrochloric acid, which sets free the carbolic

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* "The substance sold commercially under the name of creosote is often only phenic acid more or less pure; but the true creosote, extracted from wood tar by Reichenbach, is a perfectly distinct body. It is to this latter creosote that wood vinegar, tar water, the soot and the smoke of wood owe their antiseptic properties. (Gerhardt, t. iii. p. 18.) According to M. Fairlie and M. Scrughain, this creosote would be a combination of phenic acid and hydrate of cresyle."

acid. To obtain it pure, it must be digested with fused chloride of calcium and re-distilled once or twice. After several rectifications, and by cooling slowly, it can be obtained in a solid colorless crystalline mass.

"The pure acid has an odor resembling creosote; the specific gravity =1·065. It burns with a reddish flame; boils between 187° and 188°. It does not redden litmus, only making an oily stain on the paper. It is soluble to some extent in water, but is very soluble in alcohol, ether, and acetic acid, as well as in glycerin and the fixed and volatile oils.

"The pure acid acts energetically on the skin. A weak aqueous solution coagulates albumen and the blood, and acts as a strong antiseptic. Putrid meat and fish, fæcal matters, and fermented urine instantly lose their disgusting odor, when immersed in or treated with the solution.

"Chemically, phenic acid is a weak acid. It combines with metallic oxides, but the salts have little stability; carbonic acid decomposes them. Those with an alkaline base have always an alkaline reaction.

"In consequence of the supposed little solubility of carbolic acid in water, it has hitherto been chiefly employed mixed with powders, as in the case of Smith and McDougall's disinfecting powder; but the author of these papers has by careful experiments determined that the pure acid is sufficiently soluble in water for the solution to possess the power of coagulating albumen, of arresting or preventing spontaneous fermentation, and consequently of destroying infection. The saturated solution acts also on plants and the lower animals as a violent poison, though containing but about five per cent. of the acid. The solubility of the acid may be considerably increased by the addition of from five to ten per cent. of alcohol or of acetic acid.

"From the experiments which the author has made on the action of phenic acid on plants and animals, it appears that a very weak solution will instantly destroy the lowest forms of animal and vegetable life. The juices of vegetables are prevented from becoming mouldy by the addition of the smallest quantity of the acid. Herbs and shrubs watered with a stronger solution rapidly die.

"The microscopic beings concerned in the production of putrefactive fermentation are as quickly destroyed by a weak solution, and the putrefaction is completely arrested. Parasitic and earth worms also are easily killed by a solution containing one-half per cent., or by exposure to air containing but a small proportion of the acid. An injection of water containing one-half per cent. of the acid brought away from a child a large quantity of *ascarides lumbricoides*, all dead. A stronger solution kills the eggs of ants and earwigs, and larvæ of butterflies, caterpillars, etc.

The author has studied the action of the acid on the mammalia with mice, guinea-pigs, dogs, and horses, as well as men.

"*Action on the Human Skin.*—Immediately after the application of a thin coating of the pure acid, a sharp smarting is felt, which lasts about an hour. The epidermis becomes wrinkled, and in a short time the formation of a white body may be remarked wherever the acid has touched. This white coloration results from the action of the acid on albumen; it disappears by degrees, and is replaced by some congestion, which lasts about twenty days. This congestion presents all the characters of an intense inflammation, being attended with redness, heat, and swelling. If a small piece of the epidermis (which appears raised as in a blister) be stripped off no serum escapes. The epidermis becomes detached by

degrees, and when the exfoliation is complete a brown spot remains, which testifies for a long time to the energetic action of the acid. After a number of experiments on his own arms, and the arms of his friends, M. Lemaire assures us that the smarting never lasts longer than an hour. The redness of the skin endures about twenty days, but the inflammation never extends beyond the part to which the acid has been applied.

"*Action on the Mucous Membrane.*—The action of the pure acid on the mucous membrane is, of course, analogous to its action on the skin; acute smarting, shriveling up of the epithelium, and a milky coloration being observed. The smarting does not last so long as on the skin, especially on such membranes as produce an abundant secretion; and the epithelium quickly returns to its normal condition.

"*Action on the Respiratory Organs.*—From experiments on mice and horses, the author concludes that the higher animals may breathe the diluted vapor of the acid for a long time without discomfort or danger.

"*Mode of Action.*—The general fact resulting from the author's experiments is that phenic acid acts on plants and lower animals as a violent poison.

"When the action of the acid on a semi-transparent leaf is examined, it is easy to prove that it coagulates albumen, and that the parenchyma and epiderm are contracted. This explains how it is that microphytes and microzoons die so quickly in its presence. All animals with a naked skin, and those which live in the water, die sooner than those which live in the air and have a solid envelope. The difference appears to result from the power of absorption, which is much greater in the former than the latter.

"When frogs are placed in a saturated solution (5 per cent.) of the acid the skin shrivels and becomes milky from the coagulation of the albumen. The branchiæ of fishes also become white. This coagulation of albumen led the author to suppose that the death of the animals resulted from the coagulation of their blood. To verify this supposition, he examined, under the microscope, the action of the acid on the branchiæ of the larvæ of salamanders, in which the circulation of the blood is easily seen. He then observed that, although the solution arrested the circulation instantaneously, it altered neither the form nor appearance of the blood globules. All the change consisted in their immobility. When the blood is coagulated by mineral acids the form of the globules is changed. With carbolic acid nothing of the kind takes place. Besides this, a post-mortem examination of a dog and horse proved that the blood was not coagulated. Phenic acid, then, does not kill by producing coagulation of the blood! Its action on the blood globules, however, leads M. Lemaire to think that these globules are living beings.

"Insects exposed to a weak dose of the acid become asphyxiated, but they soon recover in pure air.

"When a gramme or two dissolved in water are administered to a dog, the animal falls as if struck with lightning, but soon recovers again. The sudden fall the author ascribes to violent pain, and the rapidity with which it is absorbed and carried to the nervous centres.* It is on the nervous system, then, that phenic acid principally acts."—(*Chem. News.*)

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* "Is not the action of the acid on the mucous surface rather against its rapid absorption?—Ed. C. N."

Steel improved by Manganese.—"Although manganese does not determine the conversion of iron into steel, as Karsten has well shown, it is nevertheless certain that—besides rendering steel capable of being welded—it has an influence in improving the quality of steel. M. Caron considers that this influence may be explained by the aid of facts which he has formerly made known. When a sufficient quantity of manganese is added to gray pig iron, the carbon of which is to a great extent in a free state, white pig iron is obtained, in which the carbon is almost entirely in a state of combination. The effect is the same with steel; a very small addition of manganese is sufficient to retain the carbon in a state of combination, and, in consequence, to confer on the metal the characters peculiar to good steel. However, the amount of manganese in steel must not exceed $\frac{5}{1000}$th; more than that renders steel hard and brittle, the surface of fracture becomes crystalline, and the metal is deficient in tenacity."—(*Ibid.*)

Silicium and Copper Alloy.—"MESSRS. DEVILLE and CARON have lately been making experiments on the properties of a new gun metal, a compound of silicium and copper. When copper contains rather less than five per cent. of silicium, it presents a fine bronze color, is fusible, and rather harder than bronze—but is perfectly ductile, and can be readily worked without clogging the tools as bronze does. Its tenacity is remarkable, being equal to that of iron. Silicium is the basis of sand, and the manufacture of its compounds with copper may be made by fusing together a mixture of sand, sodium, and copper, with some common salt and fluor spar as flux. This process affords another example of the great use of sodium in the metallurgic arts; the commercial manufacture of aluminium and magnesium being entirely dependent on the cheapness of sodium for being economically conducted."—(*Chemist and Druggist.*)

"*Electro-metallurgy.*—This term is applied to the art of depositing metals upon one another, or upon non-metallic bodies—an important invention, which dates from about the year 1840. At the present time numerous persons are engaged in this business in Sheffield, Birmingham, and London. The simplest mode of operating is to employ in one cell Smee's or Daniel's battery, for the purpose of generating the electric force; then to have a second vessel, of a size sufficient to hold the article to be coated with metal. If it be intended to coat the object with copper, then this vessel must be filled with a saturated solution of sulphate of copper, and a sheet of copper placed into it. This is connected by a wire to the copper of the battery, another wire is made to connect the zinc of the battery with the object to be coated. The battery being set in action with weak sulphuric acid and water, the deposit of metal takes place without further trouble. If the article is to be coated with silver, then a solution of cyanide of silver is used, and a silver plate, instead of the copper-salt and plate mentioned. Every metal can be thus deposited from its solution when the proper salt of the metal is employed. If the object to be coated is metal, nothing but absolute cleanliness is necessary; but if the object be wax, plaster-cast, wood, etc., then it must be brushed over with fine black-lead, in order to make the electric fluid travel, all objects except metals being non-conductors. Beginners should commence with small objects, as a little experience is necessary to lead to satisfactory results."—(SEPTIMUS PIESSE.—*Scientific American.*)

THE

DENTAL COSMOS.

NEW SERIES.

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ORIGINAL COMMUNICATIONS.

PRACTICAL HINTS.

BY J. D. WHITE.

Diagnosis of Toothache.—If attention is given to the subject, it is surprising to observe how many mistakes are made concerning toothache. If a dentist were to be asked what is periostitis, or inflammation of the alveolo-dental membranes, or of the pulp of a tooth, he would tell you all about it. Yet when we see that mistakes occur every day, with the old as well as with the younger in our profession, something must be wrong somewhere; to get at this is the object of the present papers on the diagnosis of toothache. Perhaps it might be said, why not classify the different cases we report or propose to report, that a better understanding can be had of their distinction? That may be all very well, but we prefer to write them out as they occur, and let every one classify for himself. Men have arrived at different conclusions when investigating the same class of symptoms; hence it is difficult to make a classification. To report the cases as they occur in practice is all we aim at. If we succeed in causing dentists to be more careful, it will pay for all the trouble it costs.

Case 4.—A colonel in the United States army, over fifty years of age, called to consult us about pain on the left side of the head and face three months since; it was at times very severe. There was some soreness of the wisdom tooth (the lower one) on closing his jaws, but not severe pain; it was somewhat loose. His teeth were generally good and large; the jaws were large, but not much gum tissue. Teeth rather disposed to collect tartar; it accumulated under the margins of the gums. He was careful in brushing, but the brush did not reach it. He said he had been troubled with this pain more or less all last winter. While in a neighboring city had one tooth extracted—which was sound—the second superior molar, but derived no relief. With a very slender scraper we dipped down between

the gums and the wisdom tooth, removed the tartar, which was cemented to the tooth as if it were a thin coat of dried glue. In a few days he returned and said he had been perfectly comfortable ever since. We had removed the tartar, and his tooth was as firm as a rock; he could chew on it as well as ever he did in his life. He also presented us with the tooth which had been extracted, with many regrets at his misfortune in having fallen into bad hands. The dentist was a man of over twenty years' practice. We have the tooth in our possession.

This was doubtless a case of inflammation of the periosteum, caused by tartar, which inflammation caused some congestion or irritation of the pulp of the wisdom tooth, not sufficient to destroy it, but to cause that kind of paroxysmal pain which is experienced when a pulp is irritated by the close proximity of decay, but which is not often located in the tooth affected by the decay or which is the cause of the pain.

Case 5.—This is a very interesting case. A lady, about forty years of age, was sent to us early in the past summer by her medical adviser. She had been suffering more or less from pain on the right side of the head and face for about nine months; it was of a paroxysmal character; it also caused great pain to drink cold water, while but slight pain resulted from the use of hot substances. It was a very hot day in June; she came from the country twelve miles; had suffered all the night before; the pain had been generally most severe at night. On examination, we found the teeth all sound on that side except the second superior molar, and it only had a very small crown plug which had been in about twenty years; the teeth were all a little elongated by the recession of the gums; there was very little tartar. She was a great brusher. We told the patient we thought that the pain was due to inflammation of the pulp of the second molar. She said she did think so, as it never gave any more pain than the rest of her teeth on that side; they all hurt when she took cold water in the mouth on that side. To test the case we obtained a tumblerful of iced water and a tumblerful of hot water; we directed the patient to place one of her own fingers in the cold water, and when it became quite cold to place it in immediate contact with the second molar tooth: this was done and gave a severe shock of pain. The experiment was tried on the rest of the teeth, but there was no pain experienced. We then directed the patient to place the finger in the hot water, and when it became warmer than the blood to place it in contact with the same tooth: this was done, and it caused a more severe shock than the cold water did. The rest of the teeth were tested in the same way, but no pain was caused. We remarked to the patient that the test was sufficient to warrant us in drilling the tooth open and killing the nerve. To this she readily consented. When this was done, the pain ceased, the pulp was removed, and in due time the roots plugged, and there has been no further pain since.

We do not pretend to affirm what was the direct cause of the inflammation of the pulp of this tooth. It was a very large and long tooth, and, while it was very firm in the socket, there was a large portion of it exposed to the contact of cold and hot substances, the sudden and severe impressions of which may have been more than the pulp could resist. We suppose that as the water, cold or hot, came in contact with the teeth of that side of the mouth, the sensation was transmitted so quickly from the affected one to the rest, and the pain reflected over the whole side of the face, that the patient could not locate the origin of the first impression, and hence was not willing to attribute it to any special tooth. We may remark that several dentists had examined the same case.

It is not a new operation with us to drill sound teeth when they are painful to heat or cold in cases of recession of the gums by tartar or other causes, kill the nerves and plug them, and render them comfortable and useful for years, and we would recommend it to the attention of other operators instead of extracting, as is too frequently resorted to in such cases.

(To be continued.)

OBSERVATIONS ON THE LESIONS OCCASIONED BY THE COMING OF THE WISDOM TEETH.

BY ABR. ROBERTSON, D.D.S., M.D.

In the series of articles lately published in the Dental Cosmos on dental irritation, I confined myself almost entirely to the irritation produced by diseased teeth. I now propose to say something of the lesions produced by irregularities of the wisdom teeth. I have purposely left this part of my subject for separate consideration, and chiefly for two reasons:—

First. They are the direct cause of more acute suffering than any class, or perhaps than of all other classes of teeth. *Secondly.* Because it seems to me, from what has been written on the subject, that the mode by which they produce this mischief is less perfectly understood than of that produced by the other teeth.

I have never seen but one article (M. Trudeau's) that, to my mind, conveyed any light on the subject; that discusses one point of this kind of pathology most clearly. I shall quote it presently.

It is a very common error among dentists to suppose that the coming of the wisdom teeth produces these lesions by their pressure against the other teeth, thus forcing their crowns into too close apposition; and if I might judge from the number of articles that have been published on what has been denominated "*lateral pressure of the teeth,*" and the comments

on those articles, I should be inclined to believe that it is an almost universal error among them. That it is an error most palpable, not to say absurd, is plain, from the consideration that such pressure, whether it be little or much, could only bring the crowns of the teeth into a little closer apposition, for these crowns are so much larger than the necks of the teeth, as effectually to prevent them from impinging, to any considerable extent, upon the transverse portions of the alveoli and gums that lie between them; and the crowns themselves are so insensible that any amount of pressure on a healthy tooth, not sufficient to crush it, produces no impression of pain or other sensation. Healthy teeth, after they are once fully developed, do not and cannot press upon each other any more than a row of "ten-penny nails" driven into an oak plank can press each other! There is nothing to produce such pressure. Tumors of the jaw or abnormal growths of their roots might do it, but nothing else can. There is no lateral pressure of the teeth that can produce pain or other disturbance; resistance of the other teeth, under certain circumstances, to the development of the wisdom teeth often produces great disturbance; but of this more anon.

The disturbances caused by the wisdom teeth occur, aside from that in common with all the other teeth, to wit, caries, in six different ways:—

First. Like other teeth, by the irritation produced in coming through the gums. This is usually slight and temporary.

Second. When the space between the jaws is small, and the upper wisdom tooth has already acquired its full length before the appearance of its antagonistic lower tooth; or, as frequently happens, when the lower tooth is last in coming, the upper tooth, by having no opposite, has acquired even more than its proper length, and thus occupies more than its due proportion of the limited space between the jaws, the gum may be so far raised by the coming lower tooth, before being pierced by the tooth, as when the mouth is closed, to bring it in contact with the opposing upper tooth, so that at every occlusion of the jaws it gets bruised between the opposing teeth, from which swelling and inflammation may ensue, and thus a great deal of discomfort and pain may be induced. This, however, is usually temporary, and may, generally, be relieved very readily by an incision, or a slight excision of the gum.

Third. When, as in the preceding case, the space between the jaws, at their posterior part, is less than the combined length of the crowns of the two wisdom teeth, or when one of these teeth, by long priority in coming, has taken to itself more than its due proportion of the space designed to be equally divided between the two, room enough is not left for the projection of the entire crown of the other through the gum. As the gum can form no attachment to the crown of the tooth—the enamel having no periosteum—it remains a kind of large-mouthed, open sac or pouch about the tooth, as deep as the unprotruded portion of its crown. Sometimes

there is only room for a very small portion of the crown to come through the gum, even to only one or two of its cusps or points; then the sac has a depth equal to the whole length of the crown of the tooth. This forms a ready receptacle for food, saliva, or any other matters taken into or secreted by the mouth, where they may be retained until they are decomposed, and produce irritation, more or less, which may result in inflammation, ulceration, the burrowing of pus deep in the cellular tissues, forming abscess, causing necrosis, exfoliation, and all the other ills consequent upon severe inflammation.

These more serious lesions, from this cause, so far as my observation goes, are confined to the lower jaw, and for the reason that the upper wisdom teeth are first in coming, and are therefore most fully protruded through the gum, but chiefly for the reason that, if food or other substances were, by mastication or otherwise, forced under the edge of the gums of the upper jaw, the force of gravitation would tend to remove it, and generally would do so before it could do much harm, whereas in the lower jaw the same force would tend to keep it there.

This is a very common cause of a great deal of very severe suffering; but of the remedy very little need be said, for if the crowns of the opposing teeth have already met and not protruded to their full length through the gums, thus leaving such a sac and receptacle, and especially if the lower tooth be but partially protruded, the only effectual remedy is the removal of the tooth, thus obliterating the sac and preventing a recurrence of the trouble.

Case.—My own lower wisdom teeth were very late in coming; one at about thirty-two, and the other at about thirty-five years of age. When the first made its appearance there was only room for a portion of its grinding surface to come through the gums before it met its opposing upper tooth, and was thus arrested in its progress. A portion of the posterior grinding surface of this tooth was still covered with the gum, which was often bruised by the opposing tooth, producing swelling, inflammation, and pain. This gum I had cut away from the top of the tooth, with some temporary relief, but it was only temporary; food would work into the sac around the tooth, there decompose, and irritate and inflame the gum, and produce severe pain for many days together. This I endured at intervals longer or shorter for two years or more. I then had the tooth extracted, after which I had no more trouble from it.

A year or two afterward the tooth on the opposite side made its appearance with the commencement of a similar series of afflictions. These, however, I soon cut short by having the tooth extracted, and with the same happy results.

Fourth. The wisdom tooth sometimes comes with its grinding or multicuspidated surface toward the cheek; when, if the cusps happen to be a little sharp, or if the tooth happens to become carious, thus rendering its

edges sharp, it is very apt to produce excoriation and ulcerations of the cheek, and sometimes with the most serious consequences. This is particularly liable to be the case where the cheek is unusually fleshy and firm, as it is then brought into closer coaptation with the tooth.

James Trudeau, M.D., of Paris, in treating of lesions of this kind, (*Medical Examiner*, vol. i. for 1838,) says: "Miss H., twenty-nine years of age, consulted Dr. ——— for an immense swelling on the right cheek, opposite the wisdom tooth, which was exceedingly painful, particularly upon opening the mouth. The doctor suspected at once that this irritation depended on the growth of the last grinder, the crown of which, being directed from within outward, was penetrating into the substance of the cheek. Upon examination with the finger, this tooth was felt growing in a horizontal direction, and quite imbedded in the muscles. Had it been possible at once to extract the tooth, the patient would have been speedily relieved. But the swelling of the gums and the internal part of the cheek, which was ulcerated, interfered with the operation. The tooth was, besides, very much decayed, and would have been broken by any instrument. The indication then was to lessen the irritation, which was caused by the crown of the tooth acting as a foreign body. A piece of cork prepared so as to entirely cover this, and deeply grooved, was placed between the cheek and the tooth. This little apparatus was fastened to the first molar, and remained in its place three days. Poultices were applied to the cheek, and slightly acidulated gargles used. At the end of the time mentioned, the irritation had subsided, so as to allow the tooth to be extracted; after which the unpleasant symptoms disappeared."

Fifth. The crown of a lower wisdom tooth may turn inward, its grinding surface presenting to the base of the tongue, which it may excoriate in the same manner as one turning outward does the cheek. Of this kind Dr. Trudeau relates this

Case.—Mr. M., formerly an officer in the army, living in the country since 1815, came to Paris with the intention of undergoing anti-syphilitic treatment, laboring under the idea that he was affected with the venereal disease. He had had for several months an ulceration at the base of the tongue, on the left side. The movements of this organ were deranged. Mastication was particularly painful. The mercurial treatment, to which he submitted, by the advice of an eminent practitioner of Paris, only aggravated his symptoms. After twenty days' continuance of this treatment the tongue became enormously swelled, so as to entirely fill the mouth; the gums were in a fungous state, and the breath offensive. This treatment having been suspended, Mr. M. applied to Dr. ———. After a very careful examination, he soon discovered in the maxillary bone, at a distance of about half an inch from the posterior dental canal, a hard body, covered by a floating or movable portion of the gum. An incision having been made in the gum, a portion of the crown of the wis-

dom tooth was distinctly visible. The tooth had grown in a wrong direction, and being in contact with the base of the tongue, had occasioned ulceration. The tooth was immediately extracted, and a few days after the ulcer healed.

Sixth. Great disturbance is frequently caused, generally of a neuralgic character, by the grinding surface of the wisdom tooth (usually the lower) presenting against the posterior part of the second molar; which effectually stops the progress of its eruption. Other causes may have, to some extent, the same effect.

I have already alluded (in a former paper) to the manner in which irritation is produced by this stopping of the progress of the coming of teeth, when treating of the irritation of first dentition. The same principle holds here, as in the first dentition; the circumstances are different.

When a wisdom tooth happens—not an unfrequent case—to be so nearly horizontal in its position that its grinding surface comes against the posterior part of the tooth front of it, its advance toward eruption is stopped. But this does not prevent the extension of its root; and this extension, by a continual deposit of bony matter, makes a constant pressure on the nerve, in its canal, at the point of this root; which accounts, and which only can account, for the intense neuralgic symptoms sometimes accompanying the coming of these teeth; but I can in no other way so clearly describe my views of this matter as by again quoting Dr. Trudeau. He says, (*Medical Examiner* for 1858:) "To understand affections of this nature, it must be borne in mind that, when a tooth makes its appearance through the gums, the roots have not attained their entire length. They grow from within outward, and if the crown of a growing tooth is stopped by any impediment during its evolution, the root, increasing in length, by the process of ossification, occupies a place not intended for it by nature, and powerfully compresses the nerves of the part. It is easy then to understand the disturbance caused by a wisdom tooth's being imbedded in the coronoid process, or being arrested by the thickness of the gum, or growing against the next molar.

"*Case.*—Madame R., a young lady, twenty-two years old, felt, three or four months after her marriage, a sharp and deep-seated pain in the angle of the inferior maxilla of the left side; the pain soon extending throughout the whole bone. All her teeth were painful, not, however, of the nature of an ordinary toothache. She passed a few months in this state, and, as the pain was daily increasing, her physician, suspecting the pain to be rheumatic or neuralgic, resorted to various remedial agents to get rid of it. He began by an antiphlogistic course, by regimen, leeches, poultices, baths, emollient drinks, &c., but without avail. He then used, with no better success, dry and opiate frictions, blisters, and the different antispasmodics. Acupuncturation, a seton at the back of the neck, and the sulphate of quinine internally were also unsuccessfully tried. By the

advice of the most distinguished physicians of Paris, the lady tried the baths of Bourgies, but returned, suffering from excruciating agony. At this time she consulted Dr. ———, without, however, much hope of relief. When the doctor saw her, her countenance was extremely pallid, she was much emaciated; her strength was impaired; and her appetite gone. For a year she had been almost literally without sleep, the calm of night bringing with it only the feeling of despair.

"Her teeth were sound and white, the gums of a pale rosy color, and there was not the least appearance of the growth of a wisdom tooth. Examination was, however, directed to this quarter. A deep incision was made in the gum, with a curved bistoury, behind the second large grinder. A small probe being introduced, a hard body was felt. Under the belief, now, that a tooth was growing obliquely forward, the growth of which was prevented by the adjoining tooth, the second large grinder was immediately extracted. A few days after this operation the pain entirely disappeared, and the lady now enjoyed excellent health."

A case quite analogous to this has been lately communicated to me by my friend, Hon. M. T. Willard, M.D.

"*Case.*—A. M. P., of Hopkinton, N. H., called on me with his wife to have her teeth examined. I observed a patch on the side of his face, and remarked to him, I perceive you have a bad tooth. No ! he replied, it is a cancer—it has been there a great many years. Sometimes the doctor succeeded in healing it up for a few weeks, and then it breaks open again, and discharges for months.

"I went with him to his physician, and after convincing him of the cause, we made an incision in the gum of the under jaw, one and a half inches long, and three-fourths of an inch deep, and succeeded in extracting a sound tooth, (a dens sapientia.) After a few weeks the *cancer* was well."

The case referred to, in one of my former articles, under the head of "Insanity," (M. Esquirol's case,) it may be recollected was from a wisdom tooth, interrupted in its growth, by coming in contact with the second molar.

(To be continued.)

DENTAL SUGGESTIONS.

BY JOHN D. WINGATE.

In making these suggestions, it is hoped that the writer will be excused if, among others, he does say things known to some of the profession many years ago. All are susceptible of improvement, and having been himself greatly benefited by articles found in dental periodicals, he hopes to make himself useful in turn by trying to contribute his mite.

THE TOOTH SYRINGE.—There are still some excellent operators who do not use this most important article. To demonstrate its utility in cleansing a cavity, drill a hole—keeping it wet, as if drilling a tooth—into an instrument handle; wipe in the usual way; examine with a pocket microscope; then syringe, and examine again. The cavity will be found clear. Cold water hurts most teeth; warm should be used. It may be warmed in the syringe in the hand or over a small lamp, if warm water is not at hand.

KEEP YOUR DRILLS AND FILES CLEAN.—"Cleanliness is next to godliness." Sometimes patients from other operators complain of the uncleanly manner in which operations in the mouth are performed. Great care should be exercised to obviate suspicion in that direction. Files and drills should be brushed every time, both before and after using; before, to wet them, to prevent tooth-bone from imbedding itself too firmly in the crevices; and after, to remove anything from them. It must be revolting to see an operator approaching the mouth, with a view of working in it, with soiled or bloody instruments.

ESSENCE OF CLOVES, say nine drops of the oil to the ounce of alcohol, acts much better on patients, in extracting teeth, than brandy or any other of the strong drinks, and is much cheaper. Dose, about thirty drops to a tablespoonful of water, which may be followed by half the quantity, as occasion requires. In many cases it is preferable to ether.

POLISHING FILLINGS.—Ordinary tape, cut into pieces a few inches in length, dipped in water and then into ground silex, is excellent for polishing fillings between teeth. The corundum tape is rather rough.*

RIVETING TEETH.—The rivet punch forceps will do this work more effectually and nicer than any rivet hammer. It seldom, if not too violently used, will break a tooth. Fold a piece of printing paper about six thicknesses, and lay on the side of the punch forceps opposite the pin, on which place the back of the tooth to be riveted; then, with the punch part, the rivet may be pressed down to a perfect head. This method of riveting is particularly useful in repairing old cases. Will not some of the instrument manufacturers get up an instrument for this purpose?

PLASTER IMPRESSIONS.—Get your plaster, water, teacup, and knife to mix with, ready. Place a large napkin on the patient's lap, to catch the saliva while the plaster is in the mouth, and also any plaster that may drop down. Generally, it is best to say nothing regarding what may be expected, but the patient may be informed that the operation is trivial; and it is best to direct the thoughts of the patient into another channel; and he may also be directed to allow the head and body to in-

* The corundum tape is not used as a polisher, but as a file.—ED.

cline forward, so that any surplus plaster may fall on the napkin, and not down the throat, and to keep the tongue quiet while the plaster is soft, allowing the saliva to flow out on the napkin, and not to try to swallow. For a large mouth, about three tablespoonfuls of water may be put into the cup with plaster, mixed rather too thick to run casts with teeth on. Stir till it thickens perceptibly. This shortens the time to hold it in the mouth. The impression cup may now be filled even full; then about a teaspoonful may be taken on the fingers of the left hand, which insert into the highest part of the palate, having the face inclined downward; follow up with the filled impression cup; press it up, being careful to get the plaster under the lip and cheeks. In a very short time it will be set hard enough to remove, which may be known by the mixed plaster outside. The lips and cheek should be lifted, to admit air, when it will come away easily. The cavity may be cut into the impression. For lower impressions, it is best to take a wax impression first, and put in plaster a little thinner than for uppers. Gutta-percha, well softened in hot water, may be put between teeth inclining together in partial sets, by which means a good plaster impression may be had.

Bellefonte, Pa., November, 1863.

PROCEEDINGS OF DENTAL SOCIETIES.

PROCEEDINGS OF THE ODONTOGRAPHIC SOCIETY OF PENNSYLVANIA.

REPORTED FOR THE DENTAL COSMOS BY G. W. ELLIS, M.D.

A monthly meeting of the Society was held on Tuesday evening, November 3d.

Upon motion, Dr. Lusson was called to the chair.

The discussion of the subject of "Anæsthesia," continued from the preceding meeting, was declared in order.

Dr. Ellis said that the duties of reporting so engrossed his attention during discussion, as to almost entirely preclude the possibility of concentrating thought sufficiently to enable him to express his views upon matters, whose importance and interest often offered the strongest inducements for an active participation in their investigation. He could not, however, resist the inclination to join in the consideration of a subject which had from the first days of his dental pupilage enlisted his special attention, and from the apparently limited knowledge of its various principles, stimulated the desire and design of making it a special study.

The remarks of the previous evening had taken a somewhat different direction, and were of a less practical nature than he had anticipated, yet their importance was great in assisting to fix the credit of the first em-

ployment of ether as an anæsthetic, in surgical operations, upon whom it is due. With a full knowledge of the heated nature of the controversy, and the ardent claims urged by the various contestants, this body has seen fit to accord the honor to Dr. Horace Wells, of Hartford, Conn., to whom, from all we can learn, it undoubtedly belongs. He regarded both ether and chloroform as blessings to humanity, and, like many of the good things with which we are favored, open to either *use* or *abuse;* the former, however, he believed, on account of its comparative safety, to possess the preference, at least among the majority of American surgeons and dentists. With the conviction of its advantages in this respect, national pride would, as a *secondary consideration*, naturally and properly assist in strengthening our prejudices; but no such feelings should debar us from a thorough investigation of its merits, or influence us in rendering any other than an impartial decision. His enlistment under the preceptorship of Dr. J. F. B. Flagg, who was a pioneer, enthusiast, and recognized adept in the administration of anæsthetics, might have done much to awaken the lively interest he felt in the matter; and the unusually extensive ether practice which Dr. F. enjoyed, offered valuable advantages for obtaining a practical knowledge and securing that confidence and skill which can only result from a familiar acquaintance with the subject. He has been in the habit of exhibiting ether to the almost entire exclusion of chloroform, except as an adjunct, although he unhesitatingly employs the latter where circumstances indicate—for, fear would not prevent its use—believing, as he does, that knowledge and skill divest it of a very large per cent. of its imputed danger. He considered both capable of destroying life, and although both are dangerous, they are not equally so, owing to the greater rapidity with which chloroform induces its effects upon the cerebro-spinal axis. He was aware that many regarded ether as perfectly harmless, yet experience has confirmed him in a contrary opinion, inducing belief in a lurking danger, capable of development through ignorance and injudicious management, for, that death has never followed its inhalation, is by no means proof positive that it never will.

It is indispensable that a competent etherizer should possess an accurate anatomical knowledge of the parts which he is endeavoring to impress; a full information relative to their physiological properties; the confidence which a consciousness of ability inspires; and, in addition, an indescribable gift, like the inherent talent for music, painting, etc., and which might be termed anæsthetic *intuitiveness.* That a man is capable of recognizing signs as they present is not sufficient; he should be not only cognizant of their appearance, but capable, through the agency of his anatomy and physiology, of interpreting their cause and exact point of origin, for should dangerous results be threatened, his ignorance of their nature would serve as an effectual manacle to prevent the exercise

of systematic or well-directed efforts for averting disastrous consequences.

In the course of a conversation between two members of the profession upon chloroform, one, lacking confidence in its safety, asked, "But how do you guard against danger?" To which the other replied, "By closely watching for its first manifestation." Whence came the reply, "You are watching closely for what you fear to see, and should it occur, any exertions for preventing a fatal result would most likely prove abortive." This is true, and illustrates the worthlessness and unreliability of abstract signs without the ability to refer them to their proper cause, and in a measure anticipate their appearance.

He said that, as the great number of cases in dental practice calling for the use of ether or chloroform offered extensive advantages for the acquirement of experience and dexterity far more numerous than those afforded in a medical practice of corresponding size, it was reasonable to infer that the intelligent dentist should possess anæsthetic skill at least equal to that of the physician; consequently he would oppose the argument offered in favor of the presence of a family physician during the exhibition of an anæsthetic, upon two grounds, viz.: 1. From the inconvenience resulting from the frequent seeking of the one, and the frequent attendance demanded of the other. 2. From the fact that it is censurable for a man to undertake an operation which he feels incompetent to satisfactorily and understandingly perform, and the entire responsibility of which he is unwilling to assume. Far better to submit it entirely to one more able, than to hold him partially or wholly responsible for the bungling execution of an operation pre-eminently demanding skill.

His plan of exhibiting ether is from a sponge, held in the hollow formed by the palms of the hands, directing the patient to breathe through the mouth, as more prompt and agreeable effects are induced than when inhaled through the nostrils. He doubted the direct sedative effects of ether from local application, and regarded the diminution of pain resulting from its application to a burned surface, as due to the cooling or antiphlogistic effect exerted by its rapid evaporation.

Dr. Wardle did not regard the use of an anæsthetic agent in dental operations as of absolute importance; could not favor its use in what he considered a light operation, such as the removal of a tooth or a few teeth. Would not object to, but favors its use in formidable surgical cases, such as the removal of a limb or cases of like severity. In his practice would rather never use it; he disliked the excitement it was too apt to induce in the patient or accompanying friends; objected to the violence which the anæsthetic state seems to invite, the evidence of which was manifest in the mouths of some; he also disliked its use on account of the condition which the patient was too apt to assume during the unconscious state, the blood besmeared to a greater or less extent upon the sub-

ject's face around the mouth, which was not altogether avoidable where a number of teeth had to be extracted; he felt as much interest in extracting teeth where it was needed to relieve suffering, as he did in any other necessary operation.

Dr. Ellis took exception to the statement that the employment of ether should be limited to surgical cases of a formidable nature, and entirely ignored in the performance of an operation so trivial as the extraction of teeth; for, although the extent of the operation would *in a measure* influence our judgment, the *strength* and *endurance* of the patient are the main points for consideration.

It can be readily understood that the shock and subsequent depression occasioned by a major operation upon a patient of great physical strength would be less than that resulting from a minor operation upon one in an exceedingly debilitated and nervous condition; consequently the operation of extraction will very frequently clearly *dictate* the use of an anæsthetic as the means of obviating this shock. He thought that anæsthetics should be entirely avoided by those who would rather not use them. He believed that the persistent excitement referred to was often the sympathetic offspring of a similar condition in the operator, the almost infallible antidote being calmness and decision upon the part of the latter. He did not regard the fact that an anæsthetic condition offered inducements for an unnecessarily violent operation, as any argument against the use of such agents, but as an indication of a lack of that coolness which should characterize a good operator.

It had been urged that the use of ether leads to an unnecessary consumption of time; his experience, however, had taught him the contrary, and frequently suggested its use, as a matter of economy, in that direction. He is in the habit of using ether whenever a patient requests it, and advises it in the majority of cases presenting for the removal of teeth; and although some gentleman had expressed an enjoyment of the operation, the avidity with which ether is embraced as a means of avoiding pain, has convinced him that the fondness of patients for its performance might be estimated at considerably less.

Dr. Wardle held it to be very important to have his patient in a proper frame of mind to have teeth extracted even in a normal state; he always wants the entire and implicit confidence of his patient when he is to operate, and without it he did not care to operate; could gain that kind of confidence in 99 out of the 100 of intelligent minds; makes it a point never to deceive or make unreliable promises to patients of things which may or may not occur; in that way he failed in obtaining the confidence only of those who seemed to be incapable of understanding what was said to them, or unable to believe a statement; and for such he had no desire to operate, as it was unpleasant to both.

He sometimes gives ether, but did not like to administer it without a

previous understanding with his patient; he desired the stomach free from food; had witnessed a case in the hands of a gentleman of some renown, where the patient was enjoined to abstain from taking any food from the previous evening until the next noon, when the teeth were to be extracted, but who from a feeling of weakness took a very small portion of food at ten in the morning, from which disobedience emesis was brought on, and resulted in spoiling a valuable dress; at the next exhibition at a subsequent day, she felt a sense of strangulation, when, in a violent struggle, she removed the agent from her mouth, but being overpowered by opposing force she submitted, and the operation was performed; to him such exhibitions were not pleasant, particularly for the extraction of teeth.

Dr. Flagg would say that it was his conviction that *intuition* was, after all, the only true basis for eminent success in the use of either anæsthetic agent which had as yet been employed; but he thought that this "intuition," and a thorough anatomical and physiological knowledge of the parts to be affected by the administration of these agents, were wonderfully prone to go together hand in hand! He would take exception to this question of uncleanliness, in the direction of nausea, for he had been, for several years, in the habit of almost exclusively confining his anæsthetic practice to the *afternoons;* he was within bounds when he named 2000 as the number of administrations during the past five years, and although he never gave any directions as to the quality or quantity of the dinner to be taken by patients, and had known them frequently to come immediately after dining, giving him the information that they had taken an extra meal in view of the loss of their remaining dental organs; yet he could recall but two cases where nausea was of sufficient intensity to produce emesis; when signs presented which indicated that tendency, it was easily controlled by the exhibition of a few drops of chloroform, combined with ten or fifteen drops of comp. spts. of lavender.

Mention had been made of untoward results, such as suffering, nausea, etc., at the hands of a *good exhibitor* of anæsthetic agents, whose credentials for skill consisted of a prominent position and frequent occasion for their use in the practice of general surgery. He would regard, on the contrary, that the untoward results would rather prove that while the gentleman possessed sufficient knowledge to successfully supervise the induction of the anæsthetic condition for the purpose of operations in general surgery, (which, by-the-way, required but a very low order of power in this direction,) it was as clearly demonstrated that he was utterly incompetent for conducting patients into the state of anæsthesia, with the view to perform dental operations. This he regarded as decidedly a *specialty* of anæsthesia, and one which his varied experience indicated as that requiring the very highest power for the accomplishment of such markedly successful results in difficult cases as would cause

them to be satisfactory alike to patient and operator. Such administrations as had been referred to would not do for dental practice, and it was just such administrations as these that dentists would be most likely to secure at the hands of the "family physician," when they chose to ignominiously shirk their proper responsibility, or take part in an operation which had to be conducted by some one else, *because* this other "knew how to do it!" No *true* dentist would be guilty of joining in any proceeding which he thought could possibly be detrimental to his patient, much less should he have a partner *for the purpose* of clearing his own skirts in case untoward sequences should result, for this is demeaning his specialty. Thought that while it was often not only admissible, but decidedly advantageous to have in obstetrical and surgical cases both an administrator and an operator, it was of no less advantage in dental operations that they should be comprised in one individual.

He then read several cases of reported death from chloroform, and pointed out in detail the evident *incapacity* which the report of the cases proved to exist on the part of those who attempted the exhibition of the agents, and showed that *duplicity* and *ignorance* had probably much more to do with the fatal result, and the induction of all the "*horrid, melancholy, fearful, ghastly, livid*" concomitants, than the blessed agent, which, in proper hands, might have been instrumental for the alleviation of all suffering. "Everything was done" for the revival of these patients "without success!" Was it not reasonable to conclude that the very "doing of everything" at such hands, was the true cause of the *final* extinction of the vital spark?

Dr. McQuillen said that while there are no well-authenticated cases on record of death from etherization, the statistics of Dr. Kid prove most conclusively that death has frequently ensued from chloroformization. In a communication to the *London Medical Times and Gazette*, that gentleman says "thirty-six deaths from chloroform are noted this year, all due to a want of A B C knowledge of the subject." The recent death of young Skey, a promising physician himself, and the son of the celebrated surgeon of the same name, should dispel any doubts which may be entertained by some practitioners as to whether chloroform can be a direct and unquestioned cause of death. In this case, young Skey, who was subject to severe attacks of neuralgia, and in the habit of employing chloroform as means of relief from the intensely agonizing pain under which he suffered, excused himself to the family in this instance while laboring under a severe paroxysm, and retired to his room, where he was found some time afterward in a lifeless state, kneeling in front of a chair with his face buried in a pocket handkerchief held in his hands, and with unmistakable evidence that chloroform had been freely used by him.

The employment of an agent so powerful in its effects demands, on the

part of those who engage in its administration, a *perfect* acquaintance with the anatomy and physiology of the brain and spinal cord; and the manifestations presented to the eye and ear of the operator of the impressions made upon the cerebrum, cerebellum, pons varolii, and medulla oblongata, through the medium of the *cerebral nerves.* No study can possibly be more *interesting,* or more *practical* in its application, than to note the faithful record of the effects of chloroform on the brain made by the olfactory, optic, auditory, portia dura, pneumogastric, hypo-glossal and other nerves constituting the twelve pair of cranial nerves; and any one who is unable to read that record in a clear and intelligent manner, is unprepared to deal with an agent so fruitful of good or ill to his patients.

There is no comparison between the effects of ether and chloroform, when each are given *ad libitum.* The volatile character of the first promptly relieves the system of its narcotic influence, so that symptoms of *apnœa* disappear almost immediately with the removal of the sponge; owing to the greater density of chloroform, on the other hand, the vapor in the lungs in alarming cases can continue to exert a deleterious influence upon the *nerve centres* for some time after the appliance employed for the administration of the agent has been put aside by the operator.

Owing to the marked evidence communicated to the atmosphere of the operating room, and the tendency to headache which accompanies the exhibition of ether, he would much prefer chloroform, if he regarded the latter as safe as the former. Unpleasant as ether is to him, recognizing the claims of patients, he is in the habit of using it when requested to do so.

There is a great difference between the administration of ether on the part of a surgeon, an obstetrician, or a dentist. The first may have occasion to perform a surgical operation upon a patient in a private house, in the clinic of a college, or the wards of a hospital. The anæthethic is usually administered by an assistant; the operation performed after the induction of anæsthesia will possibly demand from ten minutes to one hour of the surgeon's time, when he can pass at once into the open air, freeing himself not only from the unpleasant effects of the agent, but every evidence of its use, so that he can call upon any number of patients without the slightest trace being manifest to them. The same is also true of the obstetrician. With the dentist it is different; having administered ether to a patient, he and the patients who visit his office during the remainder of the day must inhale that portion of the article which has become mixed with the atmosphere of the operating room. An effort may be made to ventilate the room by throwing open the windows and doors, but unmistakable traces will be left unpleasant to many who visit the office, and if the article is used frequently during the course of each successive day by an operator, it cannot but exert a

marked influence upon his nervous system. Considerations such as these would induce him to prefer chloroform, if he could regard it as safe an agent for patients as ether.

Dr. Flagg said that for his own use, if he had any preference as to anæsthetic agents, it was for chloroform; though he thought that for general use, (especially by those completely ignorant in relation to those subjects upon which one should be informed, if he proposes administering to his fellow-beings such agents as were under discussion,) sulph. ether was decidedly the better. His reasons for this were twofold, viz., that the effects were induced much more slowly by the ether than by chloroform; and that one effect of ether was not unfrequently to make patients perfectly unmanageable *by such operators* long before any portion of the medulla had ceased the exercise of its functional action; this might be regarded by the majority of practitioners as rather *negative* testimony as to *superiority* in an agent, but he felt sadly convinced of its propriety. As regards the safety of chloroform, he would say that he had yet to read the first account of death from that agent which had convinced him that the fatal result was attributable to the chloroform; but he would admit having read a great deal which pointed in a very opposite direction for the solution of the mystery attending the sad catastrophe. He did not believe it possible for any persons so to administer chloroform *to themselves* while in a sitting posture, as to give rise to the suspicion in the mind of any one capable of exercising judgment in such a case, that this agent was the *cause of death.* He was willing to concede that while in the state of unconsciousness, such a position might be fallen into as would mechanically prevent respiration, and thus produce asphyxia. He referred to the case of the druggist's apprentice, (*London Med. Gazette*, Feb. 1848,) where the patient had been left for *twenty minutes, after snoring respiration had attracted attention*, leaning forward on a counter, with his face buried in the folds of his apron! This seemed to him very like announcing the dangerous character of *mud*, because a man, while intoxicated, had fallen with his face in a quantity of it and had been found dead.

Dr. McQuillen said he could not understand how it was possible to entertain any doubts with regard to the fact that chloroform can cause death. No one would think of denying that morphia or other powerful narcotics can suspend the functions of the brain and spinal cord; and owing to the respiratory phenomenon depending for its influence on both of these, that under such circumstances it is arrested. The same is true of chloroform, when pushed to such an extent as not merely to induce loss of sensibility and consciousness by the impressions made upon the cerebrum, but also to suspend the function of the *medulla oblongata.* Arising as the *pneumogastric* nerve does from this latter body, and sending branches to the lungs, heart, stomach, and other directions, and

exercising a powerful influence over the action of the various organs named, and particularly the respiratory, when chloroform makes such a marked impression as to suspend the function of the *medulla*, respiration will of necessity cease. Experiment upon experiment has demonstrated beyond all cavil, that the *medulla oblongata* is the *centre* from which the respiratory nerves arise; other parts of the spinal axis may be destroyed without necessarily destroying life; but let this *vital centre* be removed, or its function entirely suspended, and life becomes extinct. This has been recognized as a fact from the time of Galen; the modern investigations of Bell, Magendi, Flourens, Longet, and Brown-Séquard have, however, thrown additional light upon the subject.

Dr. Flagg called attention to the ordinary inverse ratio in the action of cerebral stimulants, offering the suggestion that those which induced the state of unconsciousness the most slowly, were by no means the most persistent; while those which acted quickly, were by no means the most evanescent. Thus it was that while sulph. ether required a longer time than chloroform for pronouncing its obtunding effects, the duration of insensibility caused by the latter was often much greater than that of the former; thus, he had one case in which *three inhalations* of chloroform had occasioned insensibility of nearly a minute's duration; whereas, on the other hand, several minutes' advantageous administration of sulph. ether would oftentimes produce but momentary loss of sensation. The difference, as regarded loss of consciousness, was even more marked than that of loss of sensation. He wished to remind the members of the utility accruing from the use of electro-magnetism in cases where, through ignorance or otherwise, the exhibition of an anæsthetic had been continued so far as to produce inability on the part of the pneumogastric to respond to its special stimulus. In such case the positive pole was to be applied to the cervix, opposite the origin of the phrenic nerve, and the negative pole over the lower portion of the sternum.

Dr. McQuillen having been asked "how is it possible for the patient to continue the inhalation of chloroform, after the tongue has fallen back into the pharynx, so as to produce a decided and fatal impression upon the medulla oblongata?" replied that the fact of the tongue being paralyzed to such an extent as to fall into the pharynx, is to him unmistakable evidence that the function of the *medulla* has been seriously affected, for the *hypo-glossal* or *motor nerve* of the tongue arises from that body, and derives its motor impulse from it. Respiration being arrested under such circumstances, the inhalation of course would cease, but the vapor already in the lungs would continue to exert a baneful influence upon the nerve centres, and if prompt employment of remedial agencies is not made use of, life will soon become extinct. As Bichat said, life rests upon a tripod formed by *innervation*, *respiration*, and *circulation*. The last of these to be arrested as a general thing is the *circulation*, and this is owing to the rhythmic

motion of the heart continuing independent of the nervous system; this action, which is due to a remarkable property of *irritability* or *contractility* possessed by the organ, is an endowment peculiar to it, and that it is independent of the nervous system, can be proved by the continuance of the action, after severing the connection with the brain and spinal cord. This is more marked and of longer continuance in the cold than in warm-blooded animals. The remembrance of this fact is of vast practical importance in cases like that under consideration. The first indication, therefore, in such cases, is to raise the tongue from the position in which it has fallen, so as to keep the pharynx and larynx open to admit of the passage of air to and from the lungs, during an effort which should then be made and diligently continued, to keep up by artificial means the mechanical phenomena of respiration, trusting that as the influence of the chloroform passes off, the nervous centres may resume their accustomed functions, and respiration be completely re-established. The simplest, best, and most philosophical plan which has been proposed for maintaining artificial respiration, is the one first suggested by Dr. Sylvister, viz., the patient is placed upon the back, and the hands are then seized by an operator, and the arms alternately carried over the head and compressed against the thorax, at the rate of fourteen to sixteen times a minute. During this manipulation, the thoracic cavity is enlarged when the hands are extended over the head, and an opportunity is afforded for the air to rush into the lungs; then, on bringing the arms down to the sides of the thorax, the lungs are compressed and the air is driven out.

Dr. Wardle said that he was very much interested in the facts which were brought out during the discussion; he thought that the gentleman lost sight of one fact when he contended "that the death of patients who died during the anæsthetic condition, could by no means be attributed to the agent, it was the closing of the glottis."

Now to illustrate this, he said, you could not hold the horse and wagon responsible for a theft; it was the *man*, the *active agent*, who was chargeable with the deed.

Or, if he might use another simile, and in another form of speech, he would say that it was not the rope around a hanged man's neck which killed him, (when his neck was not broken;) it was the closing of the glottis! a very good thought for the remaining friends; *i.e.* he did not die from having a rope around his neck, he only died from the closing of the glottis.

Dr. Flagg accepted the interpretation as correct, and admitted that if the rope was the means of breaking the neck, then it was the cause of death; but if by compression, it merely produced temporary strangulation, and its removal would prevent death, then, if death occurred, it was clearly not the fault of the rope, but due to the inefficiency of the attendant in not removing it!

On motion, adjourned.

PENNSYLVANIA ASSOCIATION OF DENTAL SURGEONS.

REPORTED FOR THE DENTAL COSMOS BY G. W. ELLIS, M.D.

A MONTHLY meeting of the Association was held on Tuesday evening, November 10th, at eight o'clock.

Upon motion, Dr. Peirce was called to the Chair.

"Palatine Defects" was declared the subject of the evening, and opened by

Dr. Wildman, who said that he would indulge in no general remarks, but would confine himself to a detailed account of the case, a history and description of which he was requested to present. The patient applied last May, and inquired whether an artificial palate and nose could be constructed, to which the doctor replied in the affirmative. Syphilis, in the tertiary form, had wrought its characteristic effects, depriving the unfortunate man of the vomer, the nasal, turbinated, palatine processes of submaxillary, and a portion of the malar bones, the latter being so loose as to yield upon the application of moderate force. The walls of the antrum upon one side were deficient, the fangs of the incisors exposed and decayed, and their removal, though desirable, was deemed inexpedient and unsafe. He found it necessary to obtain an accurate cast of the parts in their perfect relative positions, though the acrid secretions prevented such a result through the agency of plaster. He accordingly made use of paraffine and wax in the following way: An ordinary impression cup not serving the purpose, a rough impression of the remnants of the palatine arch was procured, models made, and a metallic plate swaged; one pound of paraffine and wax, previously placed in warm water, to bring it to the desirable plastic condition, was placed upon its surface, introduced into the mouth, and pressed well up against the arch, the portion which forced through the fissure being adapted to the remaining floor of the nasal cavity by the finger introduced through the nares; the parts were then turned free, to allow removal, marked, to favor adjustment, oiled, reintroduced, and again pressed into position. The second step was to take an impression of the sides and top of this cavity, which was effected by moulding pieces of the material, one upon each side and one upon the top, and forcing between a wedge-shaped plug. When the cast of the face was subsequently taken, this plug adhered, and being thus securely withdrawn, attached in its proper relation to the face, it afforded a key for the proper arrangement of the other portions and the completion of the entire mould. Having succeeded in securing a perfect cast, he modeled a nose in paraffine and wax, provided with a septum, which extended well back, to supply the place of the deficient vomer; to the bottom of this was attached lateral horizontal projections, which constituted the floor of the nares, and afforded support to the artificial palatine arch, which was modeled in the same material. The wax model was strengthened in the weaker

parts by imbedding in its substance small strips of metal, which gave it sufficient firmness to admit of the necessary handling without injury. The models, when complete, were invested in plaster, and the apparatus vulcanized in the moulds thus obtained as in the ordinary way, without, however, the use of a flask. When the construction of a duplicate apparatus was necessitated, flasks were employed with advantage, and the slender rods of plaster, which filled the artificial nasal cavities, were strengthened, as in the case of the wax model, by the introduction of metallic strips, thus permitting the packing of rubber with much less danger of fracture. He vulcanized the whole appliance for four hours, consuming one hour in attaining 280°, where it was held for one hour, and occupying a third hour in elevating the temperature to 320°, where it was retained for one hour. He thought, however, that it had been vulcanized too long. The external nose was rendered as natural looking as possible by the use of oil colors, although the opacity of the material employed prevented the attainment of the desired translucency. The two pieces were retained in position by first introducing the nose, when the palatine plate was secured to its under surface by means of a slide-bolt and staple. He had made use of this plan in order to avoid the absorption, which he was fearful would follow any other method of adjustment.

The apparatus was introduced on June 30, since which time it had afforded perfect satisfaction. The patient breathes freely through the nose, and speaks with *comparative* perfection, when it is taken into consideration that he was formerly obliged to fill the entire nasal cavity with cotton in order to render his speech at all intelligible. There still exists, however, a nasal twang, which as yet it had been impossible to obviate. The obturator at first occasioned some irritation of the velum, which was easily relieved; and the result is satisfactory, with the two exceptions, that the color of the nose is not as natural as he would desire, and that the effort of speech was attended by a noticeable vibratory movement. This was, however, partially overcome, by securing at the upper part a small pivot, to which was attached the bridge of a pair of spectacles, the latter being retained in position by an elastic band connecting the extremities of the bows.

He exhibited a photograph of the case before and after treatment, and the result obtained might reasonably prove flattering to both patient and operator.

Dr. Hoopes, of Baltimore, gave the description and exhibited the model of a case in which syphilis had occasioned the loss of both the nose and lips, exposing the teeth, and giving to the countenance, if it could be so termed, a ghastly and repulsive appearance. An artificial nose was modeled, to which was attached an extension, for retaining a moustache and beard, designed to conceal the oral defects, the whole apparatus being retained in position by means of spectacles, adjusted in

the manner mentioned by Dr. Wildman. Prints of this case, previous and subsequent to treatment, were exhibited, showing the great and gratifying improvement which the apparatus had produced in his personal appearance. He mentioned another case similar to that of Dr. Wildman's, in which, after the introduction of the appliance, he experienced the difficulty of vibration, to which reference had been made. In reply to a question relative to the first case, he stated that ulceration had been arrested, and that anchylosis of the tempero-maxillary articulation had taken place.

Dr. Barker said that he had read with interest the history of the first case described by Dr. Hoopes, and several points presented themselves to his mind which had probably escaped the memory of the doctor, and of which he would make mention. The patient was aged forty years, and five years after contraction the disease developed itself in the face, producing most hideous deformity, and rendering the unfortunate individual prominently conspicuous. He endeavored to avoid the curiosity and attention which his appearance attracted, by throwing the chin upon the chest and drawing a slouched hat over his features. After the adjustment of the apparatus constructed by Dr. H., the improvement was so great as to enable him to walk the street or sit at the table of a hotel without eliciting any very marked or disagreeable notice. In this case, the saliva, owing to the loss of the lips, was continually running from the mouth, a difficulty ingeniously overcome by the construction of a pouch or pocket for its reception.

Dr. Buckingham said that he had never courted such cases as those described, but had introduced four or five stiff, hard obturators, and none of them with the most flattering success. The dentist, it seems, is the receiver of all odds and ends, and is often favored with the flattering office of being the sole and worthy reliance for the performance of what all others have failed in accomplishing. He was not able to satisfactorily understand the exact duty of the velum and uvula; he regarded it a difficult subject, meriting close investigation, and would like to know their precise functions. He mentioned several cases in which slight openings through the palate induced imperfection of speech: one, of a German, in which the stem of a clay pipe punctured the velum; another in which a fissure was caused by an operation for the removal of a tumor, the speech was injured, but much improved by the use of an obturator; and a third, of a lady, in which there was a small hole through the hard palate, which seriously interfered with speech, the introduction of a plate, however, serving to entirely remedy the defect. Thought that the cases of Dr. Kingsley were very interesting, but that the functions of the velum were, in a measure, assumed, since it is impossible to observe its motions during speech. He spoke of a case of ozæna in which not only the powers of speech were injured, but the odor was so intolerably offensive as to exclude the subject entirely from any intercourse with society.

Dr. Barker spoke of the pride which dentists should feel in their capability of successfully overcoming difficulties which have baffled so many scientific men, and although physicians may discourage mechanical appliances and express a preference for plastic operations, it has been clearly demonstrated that, in the great majority of cases, the latter have proven unsuccessful. Cleft palate may be either congenital or accidental; of the former there are three classes, arranged according to the extent of the fissure: first, where it is confined to the uvula and velum; second, where it continues through the hard or bony palate; third, where it extends clear through the alveolar border. He referred to the fact that in cases of congenital fissure an infant would intuitively place the nipple under the tongue, being unable to produce a partial vacuum between the dorsum of that organ and the deficient palatine arch. He said that deglutition was always more or less imperfect in cases of fissured palate, especially where the deficiency of tissue was the result of accident. He thought that the important part performed by the velum and uvula could not be fully explained, and compared the relation of the various organs concerned in speech to that existing between the parts of a musical instrument—each integral portion contributes toward the production of a certain result, and the injury or destruction of a single one will destroy the concert of action, and perfection of tone is rendered impossible. This is the same in the case of singers, where with the loss of the teeth they have been known to simultaneously loose the gift of song. He said that in accomplished singers the flexibility of the velum was really remarkable, and cited the case of a Mr. Frazer, who was a member of the celebrated Seguin troupe; he also read some parts of an article from the pen of Dr. Stearns relative to this peculiarity. He thought that dentists should beware how they refer cases to a syphilitic origin, for struma is capable of producing very similar results; and he recalled a case, mentioned by Jourdain, where the puncture of a fish-bone caused an ulcer strongly resembling that occasioned by syphilis. He spoke of the great advantages of Dr. Kingsley's apparatus over the old-fashioned metallic plates.

Dr. Buckingham said that although such intricate and tedious operations were mostly pecuniarily unprofitable, they were frequently the means of establishing an extended reputation; he had himself on one occasion obtained much credit for the successful treatment of a very simple and easy case. Apart from this selfishness, however, there is the duty to benefit suffering humanity to the extent of our ability, and the desire of doing good, should alone prove a sufficiently strong incentive for its faithful discharge. He did not think the velum necessary to prevent the air from passing through the nose, and said that a perfect voice was often produced with an imperfect mouth, and vice versa, and we find the infant with cleft palate crying in the same strain as those in whom the arch is

complete. He referred to the great difference between the pronunciation of Chinese, New Englanders, etc., although the conformation of the parts is the same in one case as the other. He thought that mechanical contrivances were employed more for convenience than for any improvement in sound which they were likely to accomplish, and mentioned a case in which the introduction of a bulb obturator very materially facilitated deglutition. He did not think complete closure of the nares at any time necessary.

Dr. Barker said that in cleft palate the vocal cords are always perfect. He did not think the velum ever *entirely* closed the posterior nares, but that sound was directed by the combined effort of the various parts; and referred to the great expansion of the throat in the effort of singing. He called attention to the fact that in fissured palate the lateral remnants of the uvula contract with every attempt at speech.

Dr. Ellis said that he could not regard the subject as sufficiently intricate to necessitate for its perfect understanding very extended or laborious investigation; to him it had been rendered very clear by the lucid explanations of Dr. Kingsley, and he thought that much of the mystification with which it was being invested arose from the confounding of *voice* and *speech*, the former being the sound by which we are incapable of communicating our ideas until intelligibly moulded by the tongue, velum, lips, teeth, nose, etc., when it is recognized as *speech*. Therefore the fact that speech is entirely the result of education would at once account for any peculiarity of pronunciation noticeable in residents of different localities; but if the velum be deficient, the speech is not *peculiar*, but *defective*. He thought that much misapprehension existed relative not only to the function of the velum, but also of the way in which it is discharged, for it seems to be clearly demonstrated that it assists in deglutition, and serves to close the posterior nares during the pronunciation of any other than the nasal sounds, the complete formation of these, however, requiring a free issue of air through the nares. When the apparatus of Dr. Kingsley is perfectly adapted, he understood the posterior nares to be closed more by the approximation and contact of the posterior wall of the pharynx than by any very direct elevation of the appliance itself.

Dr. Buckingham contended that the sounds of *m* and *n* could be perfectly pronounced with the nares closed, and any difference which could be distinguished was simply a slight modification.

Dr. Ellis said that he believed it impossible to pronounce *m* and *n* with the communication through the nares interrupted. He regarded that the admission of a modification is the acknowledgment of a loss of some of the original characters of the sound, such a deviation from the type at once constituting a false and imperfect pronunciation.

Dr. Flagg said that he did not propose wasting his own or the members' time by discussing as to whether the articulation of the nasals *m* and

n was the same with the nares open or closed, but he would merely suggest as the reason for its *not* being so, that the action on the part of the levator and tensor muscles, and perhaps even more especially on that of the azygos uvulæ, was such as to close the posterior nares less completely during the enunciation of the nasal sounds than at other times during the act of speaking or singing. He also desired, if possible, to present somewhat more clearly than it appeared to him had been done, the peculiarities incident to especial forms of palatine defects, the difficulties to be overcome, and the methods and probabilities of overcoming them. He would endeavor to do this in as few words as possible, that in this manner it might be the more tangibly set before the minds of those present.

He stated that the practical modifications of palatine fissures or lesions were—First, congenital, (present at birth;) or second, resulting from disease or accident. That in the first, deglutition was so slightly interfered with as to be a matter of no practical importance, but that the articulation of words was impaired in all degrees, from *slightly* to *completely*, in the latter cases, rendering the efforts at speech unavailing for conveying ideas, except to those most intimately associated with the unfortunates; while in the second class *both* deglutition and enunciation were interfered with to a *very marked extent*, especially when the comparative size of the lesion was considered. We had again another modification, based upon the *position* of the lesion in either case; this had reference as to whether the soft or the hard palate was implicated, or both. In *congenital* fissures of the *soft palate* we desired to enable the patient to produce conventional articulate sounds, and, if the lesion was *very slight*, he believed that the performance of the operation of staphyloraphy *might* be conducive to this end; but if the lesion was of such magnitude as to involve the parts to the depth of one-third or more of their extent, he could not see how this end could be accomplished by such means. The correction would then depend upon the adaptation of an artificial soft velum as the only resort, and even this, practical efforts had demonstrated to be, not unfrequently, unavailing. In *congenital* fissures of the hard and soft palates combined, an artificial combination of hard and soft palates seemed to be the only hope of overcoming existing difficulties. In fissures from disease or accident, whether of hard or soft palates, or of both, we find both deglutition and articulation interfered with; and in such cases the proper adaptation of an obturator, or, in some rare cases, the recuperation due to the *vis medicatrix naturæ*, would quite satisfactorily remove, almost immediately, every indication to others of the presence of the deformity as well as all inconvenience to the patient arising therefrom.

Dr. Barker said, in cases of fissure, the result of accident, he had the authority of as eminent surgeons as Drs. Gross and Pancoast for stating that cures had been effected. He spoke of the treatment for small perforations of the soft palate suggested by Dr. Garretson, which is to pare the

edges and excite an effusion of coagulable lymph, having introduced a well-adapted plate to support it during organization.

Dr. Buckingham thought such an operation contraindicated in syphilitic cases.

Upon motion, votes of thanks were tendered Drs. Hoopes and Wildman for the time and trouble expended in bringing their interesting cases before the Association.

Upon motion of Dr. Barker, "The Laboratory" was adopted as the subject for discussion at the following meeting.

Adjourned.

BOSTON DENTAL ASSOCIATION.

REPORTED BY G. W. E.

WE extract the following from the *Boston Daily Courier* of October 13th:—

"An adjourned meeting of the Dentists of Boston and vicinity was held yesterday afternoon, at the rooms of the Young Mens' Christian Association.

"The meeting was called to order by the Chairman, and the records of the last meeting read. The committee appointed at the previous meeting to collect evidence and obtain legal advice relative to the claims of the Hard Rubber Co. upon dentists, reported, and the matter was fully discussed, and important suggestions made. It was proposed to form a N. E. Dental Association, and a committee was chosen with full powers, who will report at a meeting to be held next Monday, at 2 P.M., at the same rooms in Tremont Temple; at which meeting it is expected there will be a large gathering of the Dental Profession."

Although the State of Massachusetts has justly claimed and received the credit of possessing one of the best organized and established systems of free school education, as well as the greatest number of institutions calculated for the dissemination of useful and scientific knowledge, the dental portion of the community have been somewhat tardy in recognizing the importance of associated effort for the advancement of the interests of their specialty. The enthusiasm and activity recently manifested in Pennsylvania, New York, and Delaware, in the formation of societies, and the increased good already accruing from their increased numbers, may possibly have had its due influence in stimulating the move above referred to; if so, it is pleasing to learn that the effects of good example are so contagious, and hoping that it may spread still more extensively, we sincerely desire to see this effort meet with encouragement and success; and trust, should it be favored with such fortune, that its members may advocate the appointment of a representative delegation to the next annual meeting of the "American Dental Association," to be held at Niagara Falls, on the last Tuesday of July, 1864.

PROCEEDINGS OF THE DELAWARE DENTAL ASSOCIATION.

REPORTED FOR THE DENTAL COSMOS BY S. S. NONES, D.D.S.

THE regular monthly meeting of the Delaware Dental Association was held Tuesday evening, November 10th, 1863.

President, Dr. Marshall, in the chair.

Minutes of the previous meeting read and approved.

The Executive Committee reported the names of several gentlemen who had been nominated as corresponding members of the Society; upon ballot they were unanimously elected.

Dr. J. H. McQuillen, Philadelphia, Pa.; Dr. J. F. Flagg, Philadelphia, Pa.; Dr. W. H. Atkinson, New York City, N. Y.; Dr. J. Taft, Cincinnati, Ohio; Dr. W. W. Allport, Chicago, Ill.; Dr. Philip Austin, Baltimore, Md.

Other business matters were transacted, and a paper from Dr. Bonwill, on "Orthodontia," was then read.

In it he described the various plans adopted by different operators in the construction of their appliances; but thought he had arrived at the best plan at last. He employs silver wire, of which he makes a number of springs, coming in contact with the teeth to be operated on.

The paper was made the subject of discussion for the meeting.

Dr. Nones said he thought the plan of Dr. Bonwill was a good and effective one; but still there was room for improvement. It was too cumbersome for the mouth, and must interfere with the movement of the tongue. The manner in which Dr. N. operated on irregularities was by means of a spring, but different from that just exhibited. He would bring a case before the next meeting.

Dr. Marshall said he agreed with Dr. Nones in his remarks, but still thought it would be a good mode of correcting irregularities when simplified. He then explained his manner of correcting irregularities.

Drs. Jefferies, Shelp, and O'Daniel made some remarks on their manner of correcting irregularities.

Dr. Nones moved that Dr. Bonwill be requested to condense his paper and submit it to the DENTAL COSMOS for publication. The motion was carried.

The meeting then adjourned.

CONNECTICUT VALLEY DENTAL ASSOCIATION.

REPORTED BY L. D. SHEPARD, D.D.S.

NEW ENGLAND, though justly claiming pre-eminence in some spheres of thought and action over some other sections of our country, has been far behind in associative effort for the promotion of the interests of dental science.

Some ten years since a society was formed in New Hampshire, and also one in Vermont, which held a meeting or two and died. But during the past half dozen years, we think, New England has had no *active* society.

But now she can show at least two, which seem to give promise of success and permanency—the Merrimac Valley Association, and the Connecticut Valley Association, formed simultaneously—one embracing Eastern New England, and the other Western.

The meeting to form the Connecticut Valley Association assembled at the Massasoit House, Springfield, on the eve of the tenth of November—Vermont, Connecticut, and Western Massachusetts were represented.

Remarks favorable to the formation of such a society were made by Drs. Post, of Brattleborough, and Harwood, of Rutland, Vermont; Drs. Searle and Hurlbut, of Springfield, Howland, of Barré, Jones, of Northampton, Wheeler, of Holyoke, Shepard, of Amherst, and others from Massachusetts.

The draft of a Constitution and By-Laws was then presented, taken up article by article, discussed, amended, and adopted; and the organization completed by the election of the following officers for the ensuing year:—

President.—Dr. F. Searle, Springfield, Mass.

Vice-Presidents.—Dr. O. R. Post, Brattleborough, Vt.; Dr. C. Stratton, Amherst, Mass.

Secretary.—Dr. L. D. Shepard, Amherst, Mass.

Treasurer.—Dr. H. M. Miller, Westfield, Mass.

Executive Committee.—Dr. E. V. N. Harwood, Rutland, Vt.; Dr. C. S. Hurlbut, Springfield, Mass.; Dr. A. A. Howland, Barré, Mass.

An unusual degree of unanimity, zeal, and devotedness was manifested in all our discussions.

The next meeting for discussion will be held at the Mansion House, Greenfield, Massachusetts, on the second Tuesday in January, 1864, at ten o'clock A.M.

All dentists of good standing in Western New England are cordially invited to connect themselves with the "Connecticut Valley Association of Dental Surgeons," whose objects are "to cultivate the science and art of dentistry, and all its collateral branches, to elevate and sustain the professional character of dentists, to promote among them mutual improvement, social intercourse, and good feeling, and to collectively represent and have cognizance of the common interests of the dental profession in the Connecticut Valley."

EDITORIAL.

DENTAL WRITING.

We all start out enjoying the right of discussion to the fullest extent: of this there can be no doubt; it is a wise provision of the laws of science, and in keeping with the spirit of the times—in other words, it is the ethics of the age, and it is fair to presume that when any one speaks he ought to say something. In this wide liberty, however, it would not be right to hold every one responsible for what he says, whether there is anything in it or not, as it is not unreasonable to suppose that fancy may, in the intensity of thought, get the upper hand of common sense or of the understanding. But when a community or combination of others takes up what is said by any one, it is fair to hold somebody or the combination of others accountable. Still, if any one, in the fullness of his thoughts or desires, runs himself out of proper language to express himself—especially that language which he has studied his life long, and which has been associated with every thought and action—he commits himself at least to eccentricity. For instance, a writer in this journal, in a paper read before the New York Society of Dental Surgeons, on the "Development of Dental Tissues," says his subject "is too occult for elucidation by the use alone of any language now at command; but when a truly natural language shall find means of expression, any feeling, idea, thought, opinion, belief, or knowledge will be found easy of complete enunciation." Now we do not find the least fault with a fellow-being so "hemmed in" as this; but we think the others with whom he was associated for each other's good ought to have appointed a committee to have set him right before this dilemma was exposed to the world. But the writer very cheerfully perseveres on his own courage, and says "but because we cannot anticipate the blessedness of the coming times, and at once tell all that we can desire to communicate from the treasurer of our mental workshops, it is no reason why we should not essay to take a few primal steps in that direction." But he very happily illustrates the difference between what he does not know and what he has no language to express, by "one word of argument in proof of the assertion that the (0) naught equals all things, or that 'nothing is equal to something.'" We hope it will not be taken as a vain boast, when we assert that we could find means and language, if we were to pursue this article for much more remark; but it would be a waste of words, and no credit to the good sense of the society that was instrumental in putting this production before the world. Still, we cannot help quoting another paragraph, for the solution of which, we fear, words will not suffice. He says: "Then if all certainty depends upon the unknown, is it not clear that negation is quite equal to affirmation! or the 0 is equal to 1? or theory to practice, or infinity to eternity, or God to creation?" If this be a

solution of the problem of the "development of dental tissues," then the language is new to us; we are forced to the conclusion that this would be the pursuit of knowledge "under difficulties," were it not that the writer informs us, doubtless on his own responsibility, that "nearly the whole world have sought the final solution of the problems of creation, development, and growth, by the observations of the intellect without the aid of direct independent inspiration, and hence the fractional doctrines that have held the dominion over the minds of the best;" and, as the writer says in another paragraph, "all because they persistently deny that inspiration is the prime prerequisite to perception at all, whether by the channel of ordinary sense, or an exalted clairvoyance."

It may be asked, if this be objectionable matter, how comes it that it is presented in the pages of the DENTAL COSMOS? To this it may be replied, that the editor cannot be responsible for the ideas of others, or expect all to conform to his views. Now we have a high personal regard for the author of these sentiments; but what must his more humble companions think and feel who have nothing to aid them in their weary and laborious pursuits of knowledge but the aid only of the intellect? A nobler spirit, it seems to us, would not attempt to place itself above its companions in the pursuit of knowledge; primary schools and colleges of learning would fade into thin air, if we drop the "analytical" pursuit of our noble art. Is it not necessary for societies to be more circumspect in the ordering and writers in the preparation of papers for publication? Many articles of similar import have appeared in our journals of late, which can certainly do no good in this age of scientific pursuits. We mean no disrespect to any one or any society publishing papers of the kind, but we wish to record the fact that we do not depend upon any other process of gaining knowledge except by hard, long, and persistent labor, aided by the intellect, of which we have been but by a very humble portion endowed.

J. D. W.

NOTICE.

IN consequence of the excess of matter, we were obliged to omit several reports of Societies, with other original articles.

REVIEW OF DENTAL LITERATURE AND ART.

BY J. H. M'QUILLEN, D.D.S.,
PROFESSOR OF ANATOMY, PHYSIOLOGY, AND HYGIENE IN THE PHILADELPHIA DENTAL COLLEGE.

A MANUAL ON EXTRACTING TEETH. By ABRAHAM ROBERTSON, M.D., D.D.S. Philadelphia: Lindsay & Blakiston, 1863.—A neat volume of 198 pages, with the above title, and devoted to this department of dental surgery, has been received from the publishers. The author is well

known as a regular contributor to the literature of the profession, and as a clear, terse, and practical writer. The subject is one to which he has devoted considerable attention, and is treated with his usual care and ability. In the arrangement of the work he has adopted a plan which must meet with general commendation on the part of the profession. In the first place, the anatomy of the jaws and teeth is described in a plain and comprehensive manner; this is followed by the consideration of the pathology of toothache and the indications for extraction, the instruments to be used, and the proper method of employing them, the cases where lancing of the gums is demanded, accidents attendant upon extraction of teeth; and concludes with a brief reference to anæsthetics.

The work is valuable not only to the dental student and practitioner, but also to the medical student and surgeon. The advantage and necessity of such a work to the latter will be apparent when it is remembered that the works on general surgery are so meagre and imperfect in their description of the manner of extracting teeth that very few medical or surgical practitioners are prepared or willing to attempt the operation. In these works the extraction of teeth is usually classified under the head of minor surgery, and the description of the operation is so defective, and such little attention is paid to it by the surgeon, that an operator who will perform the major operations of surgery, viz., amputations of limbs, excisions of the maxillæ, extirpations of tumors, etc., in a highly creditable manner, will utterly fail in this from lack of proper knowledge and practice. There are, it is true, exceptions to this. Under ordinary circumstances, or in times of peace, this want of skill on the part of surgeons would be of little moment, as patients are far more likely to apply to a dentist when such operations are demanded, but at a period when hundreds of thousands of the brave soldiers of the Republic are engaged in defending the rights of our common country on the field of battle, and are far removed from the advantages afforded by the experienced dental practitioner, they are of necessity compelled to submit to the extraction of their teeth under the most unfavorable auspices, not merely on account of the inadequate acquaintance with the *indications for*, and *manner of*, operating on the part of the surgeon, but also owing to an inefficient supply of instruments with which to perform the operation, the government regulations not allowing more than four pair of forceps in all to the surgeon. To the military surgeon therefore this work recommends itself with peculiar force.

The surgeon, however, does not stand alone in respect to want of skill in this direction. There are many dental practitioners who have the most limited and imperfect idea how teeth should be extracted; and when asked to describe how they perform the operation, acknowledge that they are guided by no set principles. All they know about it is that "they place the forceps on the teeth, and then pull somehow or other, trusting to luck that the connection between the teeth and surrounding

parts will be severed without doing any serious injury." When taking this fact into consideration, it is not a matter of surprise that accidents should happen, but rather that they are not more numerous and destructive in their results.

There are some passages in the work to which exceptions might be taken; the shape of some of the forceps for instance, but as no two practitioners are likely to agree on this point, it is not worth while to waste time and paper in directing attention to minor differences, when there is no involvement of principles. There is a class of forceps presented in this work, however, to which special attention should be directed, not only on account of their value, but also as affording an opportunity of noticing the descriptive powers of the writer. He says:—

"They are a kind of semi-cutting forceps, intended especially for the removal of the roots of the incisors, cuspidati, and bicuspidati, when one has been so unfortunate as to break one of these teeth in attempting to extract it. This is commonly known as the Parmly forceps, and is a most useful and almost indispensable instrument. The blades of these forceps are shaped very nearly like a carpenter's 'pod bit,' or gimblet, with sharp cutting edge at their ends, and for about three-eighths of an inch along their sides; and are hollowed out on their approximal sides about as deep as the thickness of the alveolar process, so that when applied, they may fully cut through the process on each side, but without cutting the root of the tooth.

"Before applying this instrument, the gum should be slit along the course of the root to be removed, and dissected from the alveolar process far enough to admit of its free and easy application. It is then applied over the process, on each side of the root, as far up as is deemed necessary, from an eighth to a fourth of an inch usually, when with one stroke of the forceps, the process on both sides is completely and smoothly cut through, and the root at the same moment firmly seized, which is then, of course, very easily removed, as its attachments are nearly all cut away."

An instrument has been constructed by Dr. Robertson, upon the same principle as the one described above, but modified to suit the roots of the lower teeth. These instruments are invaluable, and any one who has once used them would never think of dispensing with them.

The substitution of new and accurate illustrations in place of the old and defective ones introduced in the work, would much improve and enhance its value. No one, for instance, unless informed of the fact in the text, would suppose that the wood-cut at page 19 was intended to represent the facial surface of the superior maxillæ, or be able to trace any resemblance between the figures (which look more like wooden pegs than anything else) presented as teeth, and the natural organs of man; objections may also be urged very properly against the limited number of forceps illustrated. Attention is directed to these defects, because they could have been avoided without any very great increase of expense. If the publishers did not feel warranted in getting up entirely new cuts for the work, they could no doubt have made arrangements with some other

publishing house, at a trifling expense, for the use of more accurate and desirable illustrations. Arrangements such as these are frequently entered into with mutual advantage to the parties concerned. The other portions of the work are eminently creditable to the publishers. And it is trusted that the book will meet with what it deserves, a large and rapid sale. It can be obtained of the publishers, and at Dr. S. S. White's depots in Philadelphia, Boston, New York, and Chicago. Price $1 50.

British Journal of Dental Science.

Nearly two years have elapsed since a number of this magazine came to hand up to the present one; it is quite gratifying, therefore, to find that it is still in existence, and it is to be trusted that its visits in future will be more regular, particularly when containing such able and well-digested articles as the one on Dental Caries, by Sidney Longhurst, L.D.S. While regreting an inability to present the entire article of this excellent writer, the following extract, which constitutes the concluding part, is offered as well worthy of careful perusal:—

"The physical characters of caries have been so carefully and minutely described as to make the subject familiar, and to render detail here useless. Prominent features only, as bearing upon the phenomena now to be considered, will therefore alone be noticed.

"That decay, after a certain stage, is simply a chemical resolution of the tooth structure, most are willing to admit. Of the origin of the disease there is less concurrence of opinion. The theories which have been advanced—the vital, the chemical, and the chemico-vital—are those which have received the greatest support. The first, as taught by its promulgators, has long since been laid aside. The second of late years has been fast falling into neglect. The last is that which at the present day is advocated by the majority of the profession. Without staying to enter into the well-known attributes of each, I pass at once to consider the subject as I understand it.

"Putting aside the pathological conditions which may be productive of a faulty conformation of the tooth structure, or the systemic variations by which it may afterward be influenced, I take it for granted that a tooth, as usually presented, if it become subsequently carious, it will be so by virtue of one of two causes—undue approximation, or enamel fissure or defect.

"The first step toward the breaking up of the enamel is, as has before been stated, conceived to be due to the untimely removal by absorption (through pressure, if the decay be approximal) of the dental capsule, before it has attained sufficient density to bear it upon itself. Caries originating in a pit or cleft I believe to be due to the same cause—an imperfect enamel covering.

"With the histology of the dentine before us, as well as the practical fact of its exquisite sensitiveness in health, we have no more reason to assume that it is able to retain its normal integrity without its enamel, than a nut without its shell. It is true the teeth are occasionally erupted entirely devoid of enamel, (the first permanent molars are not unfrequently so presented,) but rapid destruction usually results. If otherwise, the

dentine will be found to have assumed a density compensatory to its condition, in a manner similar to that seen in many other organs whose natural functions have been altered through accident or disease; having become readapted, and made capable of sustaining or performing offices for which originally they were wholly unfitted.

"The source of caries I take to be due to a low degree of inflammation (which the dentine possesses sufficient vitality to take on) consequent upon irritation produced by the admission of air and foreign matter through a defective covering of enamel, exactly in the same way as any other part of the economy would resent an injury to or loss of its investment. In the latter, the recuperative efforts of the parts are immediately brought into action to replace the lost tissue, or an equivalent; but failing, suppuration and death results.

"The vitality of the dentine, although conceived to be sufficient to cause it to suffer thus from exposure, is insufficient to enable it to resist a morbid impression from without by any effective effort of its own. Its feeble attempts to construct a barrier by the consolidation of its tubes, or by the formation of secondary or nodular dentine are usually futile; it becomes, therefore, almost a tacit sufferer.

"It has been remarked that certain uneasy feelings are often found precursory of the first inroads of decay. This is doubtless at the time when the oral fluids have obtained access through the defective enamel to the hitherto faultless dentine; irritation is set up, and hence the sensation described.

"To everything finite there must be a limit. We acknowledge the vitality of the dentine, but speak of its low degree. We may assume it to be the recipient of so much only as shall be compatible with its condition and purpose; in fact, a minimum. We have but little reason to infer, from practice, it to be possessed of a surplus on which to recruit or draw. If, then, irritation be excited at a certain point, inflammation will be set up at the expense of that part, and those immediately contiguous, robbing them of that minimum of life, and leaving it a helpless prey to chemical decomposition. If we admit, what I think is only a fair inference, that so delicate and complex a structure as dentine, normally increased in a texture at once the hardest and most impervious in the human body, would naturally militate against exposure, its capacity to take on inflammation may be assumed. It is true that the word, according to its usual acceptation, seems to imply too much when applied to tooth-bone. With it we are wont to associate the phenomena of an abnormal aggregation of red blood particles, with swelling, heat, and redness. As exhibited in dentine, we are able to discern neither the one nor the other. But starting from the fact of its sensitiveness, whether we regard its tubuli as containing the fibrils of Mr. Tomes, the soft germinal matter of Dr. Lionel Beale, or the attenuated shreds of coagulted fibrine, as suggested by others, we must assume it to be possessed, in some form or other, of nerve matter, which would seem to involve the admission of the necessity of a fluid medium for conservation and nutrition. And that this fluid should be analogous to the liquor sanguinis, and subject to the same or similar laws, would also follow. We know that certain parts of the economy are traversed by this fluid entirely void of red corpuscles, and that the latter are attracted and discernible only when irritated or diseased. Conceiving, then, dentine to be amenable to the laws which produce and regulate inflammatory disease, we will pass on to notice the part it plays in or toward the development of caries.

"Inflammation may be tersely defined as being a preternatural combustion of the living animal tissues; like ordinary combustion, needing oxygen for its support, and like it, leaving a *carbonized residue.*

"If we take a young tooth in which the capsule has been removed, and the enamel at the part left unconsolidated and porous, irritative agents are absorbed and conveyed to the dentine, which at first suffers depression, but soon assumes an inflammatory reaction, lighted up and supported at its own cost. As this proceeds, the vitality of the dentine is sapped, its fibrillæ broken down, and a minute effete matter is left, which it has no power to expel. This remains only to serve as an additional irritant, by generating an abeyance to the well-known law, that 'first and unfailing product of decay of all organized structure, *carbonic acid.*' A little leaven leavens the whole. The disease once set in motion, its subsequent progress we need not trace.

"Before leaving the subject of inflammation, there is one point worthy of remark; it is, that suppuration is not a necessary sequela of this affection, but that a frequent result of inflammation is what has been designated 'interstitial absorption;'* and this, according to the microscopical research of Mr. Tomes, is a condition constantly displayed in dentine in several stages of decay.

"It will be seen that, in giving this explanation of caries, I have borrowed a link from each of the theories previously mentioned. From the 'vital,' inasmuch as having conceived the primary impression on the dentine to be of an irritative or inflammatory origin; but the result, not of a primal internal vital action, but from an external physical cause—enamel defect. From the 'chemical,' in that after the vitality of the dentine has succumbed, the subsequent progress of the disease *is* simply in obeyance of chemical laws. The 'chemico-vital,' inserting another word for, or before 'death,' I take in its entirety. That word, as I read it, is intended to imply the death of the dentine, since to the enamel it were scarcely applicable. Its inapplicability to the dentine, in the first stages of the disease, is shown by the fact that, in cases of incipient caries, where its location is obscure, we ofttimes fail, on examination, to detect anything amiss till the probe suddenly falls upon an irritated surface of the dentine, and pain ensues. Here, then, we must certainly acknowledge caries to have commenced, but no death as yet can be said to have taken place. To my mind, the wording that would convey with brevity what I conceive to take place would be, destruction of the superstructure, exciting irritation and death of the dentine, terminating in chemical resolution.

"Against the vital theory *per se*, which implies inflammation to arise internally, and entirely independent of the perfection of the enamel, numerous and valid objections have been urged, which it were useless to repeat.

"That the 'chemical' theory, too, is inadequate to yield a sufficient explanation, is also obvious. If the deleterious compounds resulting from the decomposition of animal or vegetable substances retained in or about the teeth, were able to decompose and destroy tooth tissue during life, in the same way and with as much facility as similar agents would attack inert matter, it were but reasonable to suppose that in the case of death, when vitality has ceased to reign, and its tenement surrendered to the fulsome putrefaction of the grave, that there, and then, it would find full scope for uninterrupted progress; but such we know to be far from the

* Dr. Watson's Lectures on the Practice of Physic.

case. On the contrary, independent of their density, they are found, when compared with the rest of the economy, to endure the longest and to suffer least.

"This remark would at first, perhaps, seem to tell as heavily against one theory as the other, but in truth it is not so. A faulty tooth in a corpse will retain its integrity longer than one similarly affected in a living person. In the latter the temperature of the system, together with the feeble resentive effort of the dentine, only recoils upon itself, subtracting from the contiguous parts that which it cannot restore, leaving it weaker, and so contributing toward its own destruction.

"That caries, after a certain time, and after certain inroads on the dentine have been effected, is merely due to the ordinary phenomena accompanying chemical decompostion, is certain. It is true that the disorganization of the part involved hardly proceeds step by step through the several phases recognized in the decomposition of bone, as perfectly and completely as an experiment of the same nature conducted in a laboratory; the vital antagonism we cannot supply, hence the discrepancy. Nevertheless, we find sufficient analogy to warrant the assumption. We seem to have the struggle for supremacy between the vital and chemical forces, productive of the exalted sensibility of the dentine, but ultimately of its annihilation and subsequent disintegration. Accompanying this is the peculiar taste and fetid exhalation characteristic of organic putrefaction, and this, considering the circumscribed surface involved, to a marked degree: as well as the plentiful crop of Confervæ as shown by the microscope. As evidence also of the same may be mentioned the fact of its being much under the control of the usual antiseptics, creosote, permanganate of potash, carbolic acid, etc.; and as also corroborative and bearing on this subject, although somewhat digressive, I am induced to add a point of much practical interest.

"It has long been a prevailing opinion that, in the operation of plugging, it were better practice to allow a portion of the decayed dentine to remain to cover the pulp, than to remove all, and so complicate the case. It is, therefore, frequently left, and I am apt to think with, too often, mischievous results; and in this way. It is a familiar fact that although the absolute exhibition of nitrogenized matter in atmospheric air is essential to putrefaction, yet that, it having once become established, no matter to how slight an extent, its progress will continue to the resolution of the whole mass, even though it be subsequently hermetically sealed against future access with the atmosphere, *i.e.* oxygen. We not unfrequently see the failure of what at the time we considered a satisfactory operation, and this without assignable cause. With the above before us, we may venture a pretty shrewd guess, in many instances, as to the cause; indeed, realizing the fact, and knowing the pertinacity with which nature works her ways, we could hardly anticipate a different result.

"The question then is, in such cases where there obviously exists no alternative but to suffer a portion of the decayed dentine to remain, or to cut all away, and expose and destroy the pulp, which is the lesser evil? I would reply, leave it; but with this reservation, that it be treated with some antiseptic, by which further decomposition may be arrested.

"It has been objected to by some, who in all doubtful cases are opposed to any intermediate course, but at once advocate the summary exposure and extirpation of the pulp, that any therapeutic treatment is practically unsafe; and further, that to leave merely a thin layer of dentine, in which vitality must necessarily be diminished or lost, between plug and pulp,

were as uncongenial to the latter, as would be an artificially constructed cap, or the actual contact of the plug itself. And again, that by chemical agents we simply accomplish by other means the work nature has herself already commenced—the reduction of the dentine to a lower degree of organization. To this I cannot *in toto* subscribe. Granting that the devitalized part may be more prone to decay, still I think it may be regarded (to use a homely simile) very much as wood. While part of the living tree, it may be exposed to destructive influences with comparative impunity. As felled timber, it may be still freely assailed, yet, although vitality has been cut off, its power of retaining its normal structure remains for centuries; and to push the simile further, it is even found to be increased to a considerable extent by chemical treatment. The same, too, may be said, to take an illustration nearer home, of ivory.

"It is to the 'chemico-vital' hypothesis, then, that we must turn in order to seek a fuller and more satisfactory explanation of this disease in the variety of forms and conditions as daily presented; such as a denture, hitherto well described and apparently faultless, in a few short months falling rapidly into decay. Or, what is again occasionally seen, although, unfortunately, less frequently, mouths in which every member seems irremediably doomed and marked out for destruction—such in which we are wont to confess operative interference almost unavailing, pointing to a well-directed hygiene as the only chance, anon becoming dense and useful, and often retaining their efficiency to advanced age. Again, constitutions in which the vital power is feeble, waste and supply striving together at unequal odds, the teeth probably retained only by scrupulous care. A few weeks' inattention from ill health, and the penalty is exacted by fresh inroads of decay. Even a light abnormality of the saliva, the accumulated fragments of the invalid's diet, or the medicine itself, each and all leave their traces behind. On the other hand, he on whom nature seems to have lavished her choicest gift—the ruddy and stalwart recipient of her most precious boon—health, but who in the heyday of his strength casts about him this blessing as an empty bauble, striving, as it were, to overthrow the well-built column; and who at last, passing into our hands for some triviality, we find, from prolonged neglect, the mouth reeking with foul exhalations and fetid secretions, yet the teeth continue sound and unassailed. The 'chemico-vital' theory it is that must interpret such cases and reconcile such phenomena."

British Journal of Dental Science.

"Case of Epilepsy arising from Carious Teeth. By W. H. Waite.—Having noticed the cases of 'Convulsions arising from Carious Teeth' contained in your last issue, I am induced to send the particulars of a case which came under my notice some time ago, and which, though evidently exemplifying no fresh facts, may still be interesting to some of your readers.

"In October, 1859, a young person aged eighteen came to consult me about her front teeth, all of which—incisors and canines, upper and lower—were of the kind generally described as 'honeycombed,' the deposit of enamel being very deficient indeed. The two upper centrals were likewise much decayed, the dentine exquisitely sensitive, and the pulp of each accessible to the air and cold or hot liquids. These teeth had been diseased for four years; and for more than three years (as I was told by the mother) my patient had been subject to epileptic attacks, at first of a very slight nature, but afterwards increasing to a formidable

extent. Medical treatment of various kinds had failed to remove these seizures; and so hopeless did the case appear in the mind of the mother, that I was laughed at for suggesting that the diseased teeth might have something to do with the cause of the attacks; and further, so convinced was she that her daughter would be carried off by one of the fits, that she hesitated (though well-to-do) to incur the cost of my proposed treatment of the case. At length, however, she consented; and finding that the 'pits' in the enamel of all the front teeth were so deep that decay was inevitable sooner or later, and judging that the appearance of the mouth might be greatly improved, I decided to remove all the front teeth. This was done by degrees, and after a suitable time had elapsed I prepared and inserted two gold plates carrying the substitutes.

"A month afterward her mother called to say that the teeth fitted very well, and that her daughter had had no attacks since the removal of the last of the diseased teeth. After some months, however, my patient returned, complaining of violent pain in the right under first molar, on examining which I found a large cavity in the masticating surface, the pulp being fairly exposed. This tooth was also defective in enamel. It was at once removed; and finding the three remaining first molars more or less diseased, I advised their removal also. This was objected to, and in a few weeks another of the fits came on, succeeded by shooting pains in the upper alveolus. I soon got permission now to remove the three remaining first molars, and since that time there has been no recurrence whatever of the epilepsy, and the young lady has grown quite stout.

"I may mention that some cases mentioned in Dr. Ashburner's admirable work on 'Dentition' led me to suspect that the teeth were the cause of the seizures."

People's Dental Journal—October.

False Impressions.—The following extract, from the pen of Dr. Allport, embodies a description of the exaggerated statements indulged in by some patients, when giving an account of the suffering which they have endured at the hands of the dentist. The accuracy of the description will be admitted by every practitioner, but the occurrence of such statements, to be without the foundation of *fact*, should be the *exception* rather than the *rule*, for the mass of the world is made up of *literal* rather than *imaginative* beings. If, therefore, a practitioner acquires the general reputation of being a *hard* operator, it behooves him to institute a rigid self-examination, to ascertain in what respect he is entitled to such unenviable notoriety; for, in addition to performing operations *thoroughly*, the *manner* of doing them is no insignificant part of the operation.

To place and retain a patient in a constrained and extremely uncomfortable position, when a much easier one would have answered the purpose just as well; to stretch the mouth as if with the intention of bringing it in contact with the ear, when by passing the index finger far enough into the oral cavity to press the cheek aside, all the room and illumination demanded for the performance of the operation can be secured; to give intense pain, by the rough handling of instruments, when it could

be obviated by delicate and dextrous manipulation; and lastly, to indulge in rough and unsympathizing remarks, if the patient shrinks involuntarily from the pain inflicted, in place of affording that *moral* support which a sympathizing manner and words of encouragement will often give, are each and all good and sufficient reasons for complaint on the part of patients.

These remarks are not made with the view of detracting from the force or correctness of the article, but to present briefly another phase of this subject, which the author will recognize as thoroughly as every experienced and conscientious practitioner will do. Dr. A. remarks:—

"Every one who has paid any attention to the action of the human mind, or has observed its operations in every-day life, is well aware of the power of the imagination to produce or increase suffering.

"The great influence that this faculty of the mind has on the bodily functions, either in the production or relief of disease, has long been recognized by medical men. Says a writer, in speaking upon this subject: 'While, on the one hand, the happy effects of a well-grounded confidence are daily brought under the observation of the medical practitioner in the recovery of patients under the most unfavorable circumstances; on the other, the direful consequences of this instrumentality are strongly exhibited during the prevalence of some epidemic diseases, which are known to affect individuals in proportion to the degree of apprehension that prevails; whereas medical men and others, who, under these circumstances, are not so liable to be influenced by the terrors of an excited imagination, are much less likely to be affected by the disease, or if they are attacked, the termination is favorable in a large proportion of cases. In many instances, again, and especially after accidents and operations, though the circumstances appear to be most favorable for recovery, yet, if the *morale* of the patients be so influenced as to make them apprehend an unfavorable termination, how frequently does it occur that these prognostications are verified by the result! In like manner, predictions of the occurrence of disease or death at a certain period, by the hold they obtain on the patient's imagination, occasionally bring about their own fulfillment. It is said that in the Sandwich Islands there is a sect who assume the power of praying people to death: "Whoever incurs their displeasure, receives notice that the homicide litany is about to commence, and such are the effects of the imagination, that the very notice is sufficient with these people to produce the effect."' * * * * *

"A large portion of our happiness or misery is dependent on the workings of the imagination. This faculty may be so trained as to be a source of constant pleasure, or so directed and perverted as to make us continually miserable. It has been said that some die a thousand deaths in fearing one. So also of every pain or evil. They may be indefinitely increased by fearing them—by anticipating them—by allowing the imagination to dwell upon them, and to draw horrid pictures of suffering.

"Now this is especially so in the case of those sufferings which are experienced in dental operations, and still more particularly when the patients are children. When a dental operation is to be performed, instead of telling the patient of the pain and trouble it will prevent, the suffering that will be relieved by it, the short time it will take, and the really small amount of positive pain it will inflict, (not more than is often

inflicted by some trivial blow, fall, or other accident,) the patient listens to overwrought tales of others, allows his imagination to gloat over the matter, compares it to a thousand horrid things, and talks to others about it, until the imagination is stimulated to such a degree, that he suffers a thousand times more in the *anticipation* than is ever realized from the actual operations of the dentist.

"It is a common practice with *most* persons, when speaking of their own cases, to use the most exaggerated statements—statements even bordering on absolute falsehood—as to the severity of the pain inflicted on them by dental operations. How often do mothers, even in the presence of their children, tell of the torture, the cruel, dreadful torture—almost as bad as death itself, if not worse—which they have had to undergo at the dentist's. Ladies will get together and become eloquent, tragically eloquent, over their terrible descriptions. They will vie with each other in telling their experience, as if each were seeking to make out the most awful case possible. They have been filed and sawed, bored, scraped, punched, their mouths have been stretched and torn, their gums lacerated and cut, their teeth and nerves torn out, their jaw-bones broken, and a thousand other things have been done—some real, but more manufactured for the occasion. They will exhaust the dictionary in looking for hard words to express the terrible sufferings endured at the hands of the dentist."

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Boston Medical and Surgical Journal—October.

"The British *Medical Journal* raises the following pertinent inquiry relating to Vivisections:—

"A noble lord, and, if we are not mistaken, a keeper of foxhounds, (which sporting position may he long maintain!) is at the head of the Royal Society for Protection of Animals; and many honorable sporting gentlemen also support it. Now, the object of the Society is, as we understand it, to put down, as far as it may, all unnecessary pain which may be inflicted on animals; and, under this head, vivisections are denounced. Are these gentlemen, then, and this noble lord, ready, on the principles which they advocate, to put down their guns and their foxhounds? They are bound to do so on their own principles, if consistent. We have no hesitation in asserting that more pain (and manifestly unnecessary pain) and suffering is produced in animals by the gun of the sportsman on the 12th of August, the 1st of September, and the 1st of October, than is occasioned in any twenty years of vivisections, as practiced in this country. The fact is obvious, and readily comprehensible to any one who will give the facts of the case due consideration. Out of every hundred animals shot at, a certain percentage get away *wounded.* What is meant by the term *wounded?* Why, simply this: that the animal has been vivisected by the shot which struck it; and that, according to the nature of the part so cut up, will the pain of the animal be great or small, of short or long duration. A hare goes off with a broken leg, the two sharp ends of the bone sticking through the skin; and he may live for days in this state, and even recover from it. What vivisecting process of the physiologist can be compared with the pain inflicted on this animal by the shot of the sportsman? * * * The physiologist has this to say, which gives him an infinite superiority over the sportsman: he experiments with the object of relieving human suffering, and he operates while the animal is under chloroform. The sportsman has no other object than amusement in the business."—(*Am. Med. Times.*)

PERISCOPE OF MEDICAL AND GENERAL SCIENCE IN THEIR RELATIONS TO DENTISTRY.

BY GEO. J. ZIEGLER, M.D.

Nitrous Oxide as an Anæsthetic.—As much misapprehension appears to exist respecting the physiological influences of protoxide of nitrogen, which is again in favor for anæsthetic purposes, a few general remarks upon its constitution, medical properties, and correlations may not be devoid of practical value.

In the first place, then, with regard to the predominant characteristics of nitrous oxide it is truly *sui generis*, though closely allied in chemical constitution, material properties, and sanative effects with atmospheric air, which may be regarded in fact, as its natural prototype, differing therefrom apparently more in the proportion of its constituent elements—nitrogen and oxygen—and in the manner of their association, than in any other essential respect, although its action upon the animal economy is more intense, concentrated, and manifest than that of the latter, varying rather in the degree, perhaps, than in the nature of its physiological influence. While, however, there is thus a general correlation between nitrous oxide and atmospheric air, yet each one has special peculiarities of its own, of such a marked character indeed, as to make them appear quite distinct and render them useful for diverse as well as similar purposes.

The effects of protoxide of nitrogen upon the human system vary in proportion to the quantity appropriated and the peculiar susceptibilities of individual organisms, passing from a gentle acceleration of all the functions of the body to a high degree of physical excitement and mental exhilaration, even to a sort of delirium or ecstasy of a highly pleasurable character, during the existence of which the mind is apparently unconscious of, or indifferent to, impressions of an ordinarily painful nature. This delirium is usually, however, of brief duration, terminating somewhat suddenly, yet leaving generally a sense of permanent invigoration similar to that resulting from a free exposure to fresh atmospheric air. Besides its general physiological effects, nitrous oxide has a special tendency to the blood, brain, nervous system, and genito-urinary organs.

By thus intensifying the general functions of life, protoxide of nitrogen produces such a high degree of exhilaration as to render the mind temporarily unconscious of, or indifferent to, impressions which would otherwise occasion pain and suffering. Notwithstanding this condition of mind and body is quite distinct from that caused by ether, chloroform, and similar agents, yet it is attended in some measure with the same general results in the production of a state of insensibility, though not of stupefaction, sufficient in degree to admit of certain surgical manipulations without the usual concomitant—pain.

In chemical constitution and properties, as well as in its physiological influences, nitrous oxide differs from all other anæsthetics, for these latter are not only chemically dissimilar, but are always more or less directly sedative in their action upon the animal organism; whereas the former is *ab initio* primarily and permanently stimulant, not even being followed with any of that languor and depression so peculiar to

the others, yet while not altogether devoid of danger, it is still much less in degree, and mostly of an entirely different character from those referred to.

Instead therefore of resembling, nitrous oxide differs essentially both in constitution and properties from the ordinary anæsthetics, and is in fact, directly antagonistic and antidotal thereto, its anæsthetic effect being the result of a stimulant, and not of a sedative action.*

Protoxide of nitrogen is thus not only superior in chemical constitution and the nature of its primary effects upon the economy, but also, in leaving a permanent feeling of general invigoration instead of that sedation always in a greater or less degree attending the action of ordinary anæsthetics; and, moreover, in being in a large measure, unattended with that immediate or subsequent danger which render the latter, in the main, so objectionable.

While, however, the physiological effects of nitrous oxide are usually of a highly pleasurable and sanative character, it cannot, nevertheless, be indiscriminately employed with safety, for the artificial excitement of system rapidly engendered by its free administration may not only prove injurious by directly increasing the tendency to irritation, hæmorrhage, and inflammation in the parts subjected to surgical mutilation, but may also develop latent pathological tendencies of a different as well as of a like character in other parts of the body, in persons with certain abnormal predispositions, to such a degree indeed, as to seriously injure health, if not absolutely endanger life itself.

The precise character and particular manifestation of such tendencies will, of course, depend upon the special predisposition of the individual system acted upon, but they will necessarily be most likely to appear in certain definite parts of the body in accordance with the peculiarities of action of the disturbing agent—nitrous oxide having, as before stated, a marked preference for the blood, brain, nervous system, and genito-urinary organs.

These brief observations will suffice to show the general character of the dangers to be apprehended from the undue or injudicious administration of nitrous oxide, yet as they may not be sufficiently definite for practical purposes, I will present a more detailed notice of these extraneous tendencies.

Thus for instance, the undue excitement occasioned by the free or inappropriate use of protoxide of nitrogen may produce both primary and secondary irritation, congestion, serous or hæmorrhagic effusion, and inflammation in different parts of the body, and especially in the brain and kidneys. Besides, principally by superoxidation and over-stimulation, it may cause excessive disintegration and undue waste as well as abnormal excitement of the system, even to destructive softening of the brain, nervous tissue, and other important structures. Furthermore, by unduly accelerating functional action it may give rise to rupture of the heart and blood-vessels, or disruption and other mechanical derangements of important parts of the organism. Moreover, through its powerful aphrodisiac effects it may intensify sexual desire to such a degree as to cause unpleasant exposure or even serious trouble.

In view, therefore, of the highly important considerations for protecting

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* Vide Dental Cosmos, vol. i. No. 12; and Boston Med. and Surg. Journ., vol. xlvii. No. 19.

the general health and insuring the safety of those subjected to its influence, as well as for the morality of the patient and reputation of the operator, nitrous oxide should always be administered with great care and precaution.

Notwithstanding, however, these apparently serious objections to the free use of protoxide of nitrogen would seem to strongly militate against its general employment for anæsthetic and other purposes, yet they are materially diminished in force by the compensating fact, that it has, in some measure, the ability to counteract such tendencies, whether antecedent or consequent, through its material and dynamic power to aerate, depurate, and increase the plasticity of the blood, encourage healing by first intention, regulate innervation, circulation, nutrition, contractility, and other essential functions; and, by its general systemic invigoration and highly sanative influence, to protect the living organism against any temporary or permanent injury. While in this way some of the dangerous tendencies of this agent are counteracted, it is, nevertheless, always necessary to bear in mind that such do exist and cannot even be slightly disregarded without peril, for evil may follow when least expected; hence an enlightened judgment and a judicious discrimination are constant prerequisites in the administration of nitrous oxide, in order to form a correct estimate of contraindicating circumstances, and guard against injurious results.

These precautionary remarks are not made with any disposition to undervalue this remarkable agent or excite undue apprehension respecting the potency of its action upon the economy, but simply with a view to afford a correct exposition of its anæsthetic and other properties, for no one has a higher appreciation of its intrinsic merits and valuable sanative effects than myself, yet it is proper that the truth should be known, to enable all to avoid the evil and obtain the good.

The general sanative properties and applications of protoxide of nitrogen are numerous, diversified, and important, but as I have before treated of these somewhat at length* and hope soon again to present elsewhere some general observations thereupon, I will not invite further attention to them in this place, as they are not so immediately pertinent to the practice of dentistry.

"*On the Formation of Mucus and Pus.* By THOMAS K. CHAMBERS, M.D., Hon. Physician to H.R.H. the Prince of Wales, Physician to St. Mary's and the Lock Hospitals, etc.—I described in my last lecture the mucus globule forming nuclei in its centre, and these nuclei splitting up into two or more, subdividing and separating the whole globule into several. From this it has been inferred that it is in this way that the globules grow—that they are, in fact, cells which multiply by subdivision. But I described also the formation of buds at the side of the globules. These buds commence by the granules of which the mass of the globule consists becoming gradually more visible and distinct, and forming centres of growth distinct and separated by a conspicuous interval from the central nuclei. They are not derivatives from the central nuclei, but new starting-points of growth. This is important, because it takes the globules out of the category of cells. In a fully-formed cell it is only the nucleus, and not the transparent area of formed matter, which grows;

* Boston Med. and Surg. Jour. etc.

whereas here the whole substance grows and originates growth. The globules are, in fact, nuclei. Or we may more properly call them 'nuclear matter;' for a nucleus must be a nucleus of something, whereas these are nuclei of nothing. Nuclear matter is that which is fitted to be the nucleus of something, unless arrested in its development—in other words, organic living matter in a condition to grow and multiply. A confirmation of this occurs in a drawing by Dr. Beale. When tissues are steeped in a weak solution of carmine the only parts which receive a permanent stain are the nuclei, or young growing matter in them. Now, of the mucous globules the whole substance receives a permanent stain, as is shown in the drawing here exhibited. It appears therefore to be wholly formed of nuclear or growing matter.

"It may be remarked that the mucin, or transparent fluid medium in which the globules float, does not receive so marked and so permanent a stain from the carmine; and this appears a very fair argument for considering it as the formed substance of which the globules are the nuclei—a sort of common transparent area, a common cell-wall to numerous nuclei: just as coral is the common skeleton to millions of coral insects. Each perfect epithelial scale, each nucleus, has its own formed substance constituting its own cell-wall; in the lower grade of life represented by mucus there is a less perfect common formed substance, constituting a common cell-wall.

"Now, if the mucin, or transparent medium in which the globules and granules float, stand in the place of fully-formed organic substance or cell, it will not retrograde into the condition of growing substance. Such a retrogression does not happen in cells. In an epithelial scale, for instance, the transparent area does not become nuclear matter. But it transmits the nutriment to the nucleus inward through its substance without being destroyed. On this supposition, the formation of mucin will be the highest development of the life of the globule, for it answers to the formation of tissue from nuclear matter. And in that case we should expect to find that the nearer its normal condition the morbid secretion can be collected, the more of this higher state of life it would exhibit, and that the further from its normal condition it is, the less there would be of the formed matter. Such is the fact. The fluid which first forms on an inflamed surface contains few globules and much stringy transparent medium. Its nuclear matter has so far departed from life that it cannot form separate cells, but only an imperfect common area. But as the inflammation goes on, this power is still more and more lost; the nuclear matter cannot form the mucin, it can only multiply; and hence the stringiness of the mucus disappears, and it becomes what we know by the name of 'pus.' As far as the morbid matter itself is concerned, pus indicates in it a further deficiency of vitality than mucus—a deficiency of vitality shown first in its internal self-multiplication, and secondly in its non-production of mucin.

"The question naturally arises as to how these products of arrested vitality make their way to the surface of the mucous membrane where we find them. The pabulum whence they are developed lies on the inner side of the epithelium, whereas we find them quite uncovered. The first explanation that occurs would be that the epithelium is destroyed, and that they are in the first place the *débris* of its dissolution, united to that which would normally go to form it. This would, in fact, be a modification of the old idea, that pyogenesis was a kind of ulceration, and in-

volved a certain solution of continuity in a tissue. Indeed, it would amplify the idea, for it would extend its application to mucus as well. To this idea Professor Virchow seems to incline in the edition of his Cellular Pathology published in 1858, (p. 395,) where he represents the formation indeed of the mucus and pus globules to take place in the lower layers of the epithelium, but to be mixed with and to have their bulk added to by the outer layers which they push off.

Since then, however, several observers have found that the most intense catarrhal condition of mucous membranes may exist without any loss of the superficial epithelium. Even in that most destructive state commonly known as diphtheritic inflammation, where fibrin is thrown out with the pus, the epithelium may be perfect. Dr. Sanderson has kindly lent me some notes he made of the autopsy of a child who died at St. Mary's Hospital of diphtheric angina, in whose larynx this fact was very clearly seen. The whole interior of the organ was lined with a firm, closely adherent false membrane. When that was detached, portions of flabby concretion still remained, which could be washed off with a stream of water. 'On examining the surface,' says Dr. Sanderson, 'after much washing, it is found to be *entire*. It exhibits to the naked eye, indeed, marked inequalities of appearance, as if eroded; but these must be dependent on the adhesion of minute particles of concretion, for, on making snips of the surface with sharp scissors at those parts where the eroded appearance was most obvious—viz., on the upper surface of the epiglottis, the epithelium was found to be entire. The only exception was at the upper margin of the ventricles, where the epithelium was adherent only here and there; but there was no trace of thickening or alteration of the basis-membrane, which exhibited its normal appearance.'*

"Förster has also carefully examined, by both horizontal and perpendicular section, the epithelium of mucous membranes in a state of purulent catarrh, and has found in it either no change or very unimportant change from the normal state.

"The globules, then, or the material of the globules, must somehow be passed through the epithelium. Dr. Buhl, of Munich, has lately detected it *in transitu*, and drawn figures of it on the road. The case on which his observations were made was one particularly well suited for the purpose. The patient had died of pyæmic inflammation of the portal vein and of the bile-ducts of the liver. Now, the epithelium of the bile-ducts presents a very marked character; its cylindrical bodies exhibit an unmistakable shape. So obvious is this shape that it can be detected even when considerably distorted; and therefore he was able to trace the epithelium scale, modified by what he rationally enough concludes to be the presence in it of pus-globules. This is clearly exhibited in his sketches of the various forms or stages of altered epithelium as he saw it floating loose in the fluid pus or massed into clots. First, he shows the normal epithelium cylinder, as a medium of comparison, and of these there were great quantities. Then come a number of bodies which we can recognize, when they are here placed in a row, as perversions of the cylinder, gradually increasing in rotundity and receding in likeness; but which in their extreme of dissimilarity would not be seen to have any connection with it except by a previous knowledge of the fact.

"The majority of the enlarged cells were filled with oil-granules. Others,

* Private notes of Dr. Sanderson.

in which the fat was accumulated to a smaller amount, contained from two to ten rounded bodies exactly like the free pus-globules surrounding them—so like, that hardly any doubt could be entertained that they were cells pregnant with pus-globules. As a rule, the groups of pus-globules lay close to the thick end of the cylinder; but often between the thick end and the groups of pus-globules there was to be seen a degree of constriction, making the cell bottle-shaped. Sometimes the tail of the cell was obliterated or torn off, when it was almost globular, but even then capable of recognition.

"In cells where there were only two or three globules the nucleus remained distinctly visible and perfect. In others the granular globules seemed to be dividing and splitting up into four or six, the original nucleus of the cylinder still remaining visible. So that pus-globules evidently do not of necessity take their rise in the degeneration of nuclei of existing tissue.

"In other examples, again, the cell-contents seem entirely to have degenerated into fatty molecules, whether from the growth of the globules just described or from other causes, and in them the nucleus had degenerated along with the rest of the cell.

"I have noticed in the epithelial scales from the vagina, in cases of purulent discharge, a somewhat similar repletion with granular matter without alteration of the nucleus. And mixed with them there were also large round granular corpuscles, which had the appearance of containing pus-globules, and which might have been degenerated epithelial scales. But scaly epithelium has not such a definitely marked form as the cylindrical variety, and it is difficult to identify it in a state of transmutation.

"Remak has also found in the pus from inflamed bladder large cells which he thought he identified as the epithelium from the fundus vesicæ. These contained from six to fifteen globules, entirely filling up the interior, and in every respect like mucus-corpuscles. But he does not trace a series of transitional forms.

"It will be seen by these observations that the pus-corpuscles are not so much descendants of the epithelial cells as what may be called parasitic formations within them. They are parasites inside the epithelial cells, capable of increase by propagation within the tissue, just as on the surface the mucous globules were shown as parasites capable of increase by propagation without the tissue. And they grow quite independent of the true nucleus of the cell, and not derived from it. Thus the nuclear material may pass through the substance of the epithelial coat of mucous membrane without destroying it, and not only be itself unaltered, but may increase in quantity during the progress. This is one way in which the pus-material may reach the surface, and explains those cases in which the epithelium is quite uninjured.

"It may strike us at first as a strange thing that bodies which we are in the habit of depicting with clear outlines as solids should pass through other bodies which our pencils enable us to draw only in the same manner, and which, as far as we can see, have no holes in them. But in point of fact, our eyes being uncorrected by our other senses, somewhat mislead us in this respect, and our minds have got to view these delicate gelatinous substances as more solid than they really are. These minute masses of living matter are, in truth, much nearer to fluids, from which the assumption of definite and regular forms alone distinguishes them. We are not in the habit of seeing fluids assume any definite form except

that of the sphere under the influence of attraction, and when we see any modification in this spherical form we are apt to take it as evidence of the solidity of what we are looking at. We are apt, too, to associate the idea of separate and individual life with solid matter only. So that both grounds, both their imperfect spherical form and the impression they make of separate vitality, dispose us to regard these minute masses of living matter as solids. We should, I think, be careful to guard against such prepossessions, and should consider it as at least an open question, whether both epithelial scales and elementary globules may not possess rather the properties we attribute to fluids.

"We find these fluid or semi-fluid properties exhibited by epithelial cells in their daily duty of absorption. Fat, from its highly refractive powers, can easily be traced, though a fluid, by the microscope; and fat in globules can be seen passing through the substance of the epithelial cells of the intestines during their active state. This is well shown in some recent drawings, made by Balogh, of intestinal epithelium during the ingestion of fat; the whole thickness, not a central tube, but the whole thickness, of the cell is seen permeated by it, and allowing it free passage. The physiological passage of fat-globules inward may reconcile us to the idea of the pathological passage of pus outward.

"But Professor Henle well says: 'If they are sometimes formed in the interior of a cell saturated with their material, this fact does not exclude the possibility that just in the same way they may sometimes be developed from the same plasma beneath the cells.' In such case they would be projected on to the surface between the separated epithelium cells.

"This other mode of growth and attaining the surface is strikingly shown in a drawing by Dr. Edward Rindfleisch, of Breslau, which exhibits in section the nictitating membrane of a frog affected with a partial catarrh of the eyes. One part represents the normal state, where the *membrana propria* (as Professor Henle calls it) is seen as a moderately transparent layer, with its delicate areolar tissue-corpuscles, and the epithelium as two parallel rows of equal-sized cells. In another, the pathological condition is represented: the pavement of epithelium is thrown up and separated by nucleated pus or mucus globules, which are seen to proceed from the membrane beneath. And the substance of this membrane appears to be saturated and rendered opaque by what must be an earlier condition of the same bodies.

"These observations seem to show that the pus or mucus globule on mucous membranes is the material of young or renovated epithelial cells, arrested in its development at the earliest dawn of life, before it has assumed the form of a cell, when it is as unlike its destined final form as an egg is to a chicken. They seem to show that in this state it may be thrown directly off by the epithelium being broken, or it may pass into the substance of the epithelium. In either case it does not part with the low degree of life it has acquired; but neither does it acquire a higher degree; it goes on propagating, but nothing more.

"Both Buhl's and Rindfleisch's observations seem also to prove that pus-globules are not produced, or at least not produced only, by the degeneration of existing cells; they are not tissue retrograding into a lower form of life like fatty, amyloid, and similar morbid matter. Buhl's drawings especially exhibit the nucleus of the epithelial cell intact along with the newly-formed pus-globule. They differ, however, in one particular,

that whereas according to Buhl the first pus-globule produced free in the cell increases itself by division, Rindfleisch assumes a splitting up of the whole contents of the cell according to the analogy of the egg-yolk. As Buhl's observations are made upon epithelium alone and Rindfleisch's upon areolar tissue also, and in one case the epithelium remained perfect and in the other was broken up, I can see no inconsistency in allowing both to be correct, and to represent the different behavior of growing matter under different circumstances.

"A very ingenious place has been selected by Junge for the investigation of the growth of pus—viz., the tunic of the aqueous humor in the eye. He caused inflammation by the application of a hot wire to the cornea of an animal, and was thus able to see what went on in the deeper parts of the eye without exposing the affected tissue to the air or any other extraneous agency. He was thus able to see the active proliferation of globules by division and subdivision so far as the formation of large masses.

"As the secretion on the surface of mucous membranes becomes more opaque or 'purulent,' so the globules are more and more regular in size, rounder, and more like one another. In transparent mucus most of them are oval, with nuclei indistinct and various in number, while there are often lumps on their sides distorting the form. In creamy pus they are nearly all of a size, and present two or three well-marked nuclei. This is easily accounted for, if we admit that they are multiplied on the surface of the membrane. When first formed, they appear under violent and varying circumstances, different in degree every moment, and therefore are different in form; but when once separated they may go on multiplying under favor of nutriment and heat for several generations. Thus, like wild races of animals, they lose individual differences, and become more and more similar and uniform in characteristics.

"The formation of pus in deep-seated parts is, of course, not so easy to trace as on surfaces, and experimenters seem deterred by the difficulty of the subject. In all tissues where pus is found, its optical characteristics are the same as the fully formed pus of mucous membranes: it presents globules all nearly of the same size, and with a pretty even amount of nuclei. This is its complete condition; but what it is like immediately on its separation we do not know. We cannot trace it through a stage analogous to mucus.

"Of its previous condition, however, we may form a shrewd conjecture. The same elementary substance which appears on, or rather in, integumentary tissues as the common material of the various kinds of epithelium, appears also as granular nuclei in other tissues—in the ganglia of nerves, in the brain, in the parenchyma of the liver, in the spleen, thyroid and thymus, etc. The same bodies occur also in the blood, where they have been termed 'chyle-corpuscles' and 'white cells.' They are found in largest quantities in the most recently formed, most quickly growing, and most actively renewed component parts of the animal frame. In short, the most rational interpretation of this form of organic matter is that which represents it as the common material of all tissues in its earliest state of elementary life. And as that which was to have formed epithelium is cast off as the basis of the mucus and pus globule, so that which was to have formed hepatic parenchyma, nerve, or areolar tissue becomes pus, perhaps through some unsuspected transitional stage.

"In this account of organic forms in pus and mucus I have endeavored

to harmonize the contributions of several observers. I have done this mainly by omitting points of observation and deductions in which they differ from one another, and putting together those on which they agree. Their harmony also has been much assisted by translating into a common language the various terms in which they express the laws of life which their observations appear to exhibit. It is curious how often plain English reconciles difficulties; and I cannot but think the proverb which assigns '*longa verba longis auribus*' quite as applicable to physiology as to social life."—(*Lancet.*)

"*Carbolic Acid.* By F. CRACE CALVERT, Ph. D.—In answer to Dr. Frodsham's letter in *The Lancet* of the 17th inst., respecting the similarity which he supposes to exist between carbolic acid and creosote, allow me to state that I am astonished that a medical man should assume that bodies which have a *similarity* of composition and properties must necessarily be *identical* in composition and therapeutic action. Several of my medical friends, who have had many years experience at the Manchester Royal Infirmary and elsewhere, and who used creosote for twenty years before carbolic acid in its *pure state* was brought under their notice, have ascertained that the therapeutic effects of carbolic acid differ essentially from those of creosote. I may add, that during the process of purifying carbolic acid, several homologous substances are obtained which at first sight resemble carbolic acid much more closely than does creosote, and which, when examined chemically, or with reference to their therapeutic action, are found to be totally different.

"As to the completeness of the chemical distinction between creosote and carbolic acid there can be no doubt. Gerhardt, Laurent, Gorup, Reichenbach, Devile, etc. have all, by their researches, proved that carbolic acid and creosote are distinct substances. For instance, the specific gravity of creosote is 1040; that of carbolic acid, 1065. Creosote remains fluid down to 13°, and boils at 397°; while carbolic acid is a solid, crystallized substance, fusing at 93°, and boiling at 370°. No liquefaction of carbolic acid could communicate to it this difference of properties.

"Without entering, in a medical journal, into the varied actions of creosote and carbolic acid when placed in contact with sulphuric acid or caustic potash, under the influence of heat, the action of nitric acid upon the two substances is quite sufficient to distinguish chemically between them. The ultimate result of the action of concentrated nitric acid upon carbolic acid is pure picric or trinitrophenic acid; while upon creosote, oxalic acid and a brown resinous substance, together with a small amount of picric acid, are the products obtained.

"I take this opportunity of supplying an omission in my former communication, and to urge the importance of using for medical purposes, pure, solid, and nearly inodorous carbolic acid, as I have heard of several serious accidents arising from the use of impure acid, either from its containing some of the homologues of carbolic acid, or from some of the chemicals employed to extract it from coal-tar having been inadvertently left in it.

"It is probable that the reason why some medical men have assumed that the therapeutic actions of carbolic acid and creosote are identical, is that large quantities of impure carbolic acid have been sold under the name of creosote; but now that pure carbolic acid has been carefully

tested, no doubt can remain as to there being an essential distinction between the two substances."—(*Ibid.*)

Amaurosis from Tobacco.—"Dr. Mackenzie, in his great work on Ophthalmology, expresses his belief that tobacco is a *frequent* cause of amaurosis, and adds, that 'one of the best proofs of tobacco being a cause of amaurosis is in the great improvement in vision—sometimes complete restoration—which ensues on giving up the use of this poison,' and cites a very striking case in illustration. With him I agree also in the conviction that tobacco is a common cause of the cases of partial loss of sight that are daily to be found at our hospitals."—(J. C. Wordsworth, *Ibid.*)

"*On Amaurosis from Tobacco.* By M. Sichel.—M. Sichel observes that among cerebral amauroses there are two forms but little known. One of these, observed in drinkers, he himself described as symptomatic of delirium tremens several years ago. The other, due to the use of tobacco, and first indicated by Mackenzie, he once doubted the existence of. Subsequent experience has, however, convinced him of its reality, so much so, that he is now of opinion that there are few persons who have smoked during a long period more than five drachms of tobacco per diem without having their vision and frequently their memory enfeebled. Both these forms of amaurosis are characterized by the absence of well-marked symptoms of cerebral congestion, the symptoms vibrating between those of sthenic and asthenic amaurosis, and the surgeon remaining in uncertainty as to their seat and nature until the special cause is discovered. The ophthalmoscopic symptoms, as in most old cerebral amauroses, are negative or slight, and common to other cerebral amauroses. These two forms of amauroses, like all affections dependent upon an inveterate habit, are very refractory to treatment. Generally, the two forms are observed separately, but it is not rare to find them united, and it then becomes difficult to assign the respective shares to the alcohol and tobacco in the production of the amaurosis. M. Sichel relates an interesting instance of this combination, remarkable for yielding in so short a period as six weeks, while from three to twelve months are usually required to effect amelioration in these cases. In treating them, discontinuance or diminution of the habit is a great and a difficult desideratum. Depletion, even local, should be employed with the greatest caution; and stimulating liniments or flying blisters may aggravate the symptoms. A purgative consisting of equal parts of magnesia and cream of tartar is an excellent means when the function of the stomach is active, alternating it with pills of gum ammoniac and aloes; but in the disordered stomach of drinkers, small doses of rhubarb and magnesia, given twice a day, one hour before meals, form a good corrective. Bathing the eyes and forehead with cold water, irritant pediluvia, and dry cupping or flying sinapisms applied to the extremities, are excellent adjuvants. In M. Sichel's case, an ointment composed of one part of the black oxide of copper and ten parts of lard was applied to the temples, and was succeeded by flying blisters. M. Mercier, in corroboration of the unsuspected effects of tobacco in generating disease, related a case in which a cough, which had persisted for a year, and purpura, which had lasted for seven months, soon yielded after the cessation of smoking, which had been excessive. His own practice had furnished him with full proof of the depressing effect of this agent upon the generative functions."—(*L'Union Méd.* and *Brit. and For. Med.-Chir. Rev.*, and *Dub. Med. Press.*)

"*On the Agency of the Periosteum after Excisions.*—In this paper M. Forget passes in review a prolonged discussion which took place in the Paris Surgical Society, consequent upon a report which he presented to it upon Professor Rizzoli's memoir on 'Sub-Periosteal Resections.' During the discussion the whole question of the osteogenic power of the periosteum was handled, and the following are the ultimate conclusions which M. Forget believes to be fairly deducible: 1. The osteogenic property of the periosteum, brought into light by recent researches in experimental physiology, has been much more utilized of late years than formerly. 2. The part which surgery can derive from this property in the treatment of diseases of bone is limited, especially by the condition of the periosteum, the characters of these diseases, and the nature of the local and general causes which have produced them. 3. Sub-periosteal resections, applied to organic and traumatic lesions of bones, have not, thus far, furnished results resembling those derived from experiments upon animals. 4. Preserved in the midst of a resection, or of a fracture with loss of substance of bone, the periosteum may there become the generative element of a new ossification, which the surrounding tissues would themselves be incapable of producing in a like degree. 5. The bony tissue of this new formation is not a faithful copy of the physiological bone. It is only an incomplete production of its form, solidity, functional aptitude, and anatomical structure. 6. In those pathological cases in which clinical experience determines amputation to be necessary, no fact, to the present time, has demonstrated the possibility of avoiding this by means of sub-periosteal resection. 7. Nor has any clinical observation as yet shown the superiority and advantages of sub-capsular periosteal resection in the treatment of surgical affections of the joints, whether spontaneous or traumatic. 8. In the operations for facial autoplasty, the periosteum may be usefully comprised among the flaps serving as a basis for the production of osseous or osteiform tissue, capable of repairing loss of substance and solutions of continuity, undergone by the bones of the face."—(*Ibid.*)

Osteoplasty.—"M. Huguier claims the invention of 'osteoplasty' for the removal of tumors situated behind the upper jaw. This operation (which is generally ascribed to Langenbeck) consists in liberating the upper jaw, or a great part of it, from its connections sufficiently to allow of its being displaced, so that the operator may penetrate to the parts behind it, but leaving it connected with the skin and soft parts, and with the neighboring bones and periosteum in some part. After the removal of the tumor, the bone is pushed back into its position, so that it may unite there, and the patient recover without deformity. M. Huguier says that he practiced operations of this sort five or six years since.

"M. Demarquay has recorded two cases of naso-pharyngeal polypus, in each of which he practiced an osteoplastic operation, and believed that the bone which he removed was regenerated. The polypus in both instances was of moderate size, confined to one side, and not involving the orbit or zygomatic fossa. He turned back a triangular flap from the cheek with great care, to raise the periosteum along with the soft parts, then divided the ascending process of the superior maxilla, and removed it, with the front wall of the antrum, so as to obtain a large opening into the nostril of that side. The polypus was then easily extracted. In both cases, M. Demarquay believed from the sensation of the parts that new

bone had been regenerated. This sensation was perceived in one case, as it seems, only with the finger. In the other, he introduced a pin, and felt resistance from so hard a body that he concluded that it must be bone."—(M. Dolbeau, *Ibid.*)

Reproduction of Lower Jaw.—In some notes to the *Dublin Med. Press* respecting the N. York hospitals, R. J. Halton, Esq., states that "the collection in the Museum of the Bellevue College contains a great many valuable specimens of surgical pathology, and among them that which interested me most was the head of a girl aged 18, that had been operated on by Professor James R. Wood for necrosis of the lower jaw. He removed all the bone with great care, leaving the periosteum behind. The bone was entirely reproduced, and with the exception of being a little flatter in some places and a little rounder in others than is usual in the normal condition, there is nothing to show it was once absent. Some time after he removed a portion of the superior maxilla of the same patient with the like success. It certainly may be quoted as an example of one of the greatest triumphs of conservative surgery. The patient lived two years after the operation, and died eventually from abscess in the brain."

Staphyloplasty.—The same writer says he "was fortunate enough to see Professor Wood operate for cleft palate and deficient uvula, and on looking into the patient's pharnyx after the operation, found it difficult to believe that the uvula was only just constructed, it looked so natural, if the stitches and chasm in the palate proper did not show the real state of the case. The patient, whose quietness during the operation and apparent unconsciousness of suffering surprised me, was, as Dr. Wood informed me, educated during the previous three weeks by passing instruments into his pharnyx every day, so that he would allow a bistoury to be plunged into the mucous membrane at any part of it without shrinking, which would seem to be of great importance in operations of this sort."

Insensibility of Periosteum.—Dr. W. N. Cote writes to the *Med. and Surg. Reporter*, that "M. Jobert de Lamballe, in a recent paper on the regeneration of animal tissues, establishes the fact that the periosteum is insensible. This subject requires to be thoroughly discussed before adopting any formal conclusions."

"*Hare-lip and Cleft Palate.*—At a late sitting of the Academy of Sciences, Dr. Sedillot read a paper on a remarkable case of hare-lip, complicated with a wide split existing in the roof of the mouth, or hard palate. Dr. Sedillot, following Professor Langenbeck's method, first detached the periosteum from the two osseous surfaces of the palate right and left, and joined them together, so as to close the hiatus. This was done on the 23d of May; on the 30th the roof of the mouth was restored, except a small fissure still remaining at the further end. As it would have been the height of imprudence to renew the operation before the newly closed parts were perfectly consolidated, the operator waited until the 26th of August, when the fissure was closed by means of a portion of periosteum borrowed from the adjacent part. It was remarked that the portion previously restored had undergone no ossification, but

had nevertheless been covered by a new mucous membrane, while the space which had been denuded of its periosteum had received a fresh coating."—(*Ibid.*)

"*Neuralgia treated with Solution of Morphia in Tincture of Iodine.*—As a corollary to his remarks on the efficacy of tincture of iodine in the treatment of neuralgia, M. Bouchut adduced several cases, from which it appears that when the remedy in its pure state has proved unavailing, the pain sometimes yields in a remarkable manner, when a certain amount of morphia has been added to the tincture. In this instance the application is not merely counter-irritant, indeed in this respect the fluid would seem to have lost some of its power; its efficacy is chiefly due to the presence of the sedative, the introduction of which beneath the epidermis is facilitated by the tincture of iodine. Whatever explanation may be offered of the effects of this mode of treatment, its beneficial operation is an unquestionable fact, deserving of every attention. Thus, we noticed in M. Bouchut's wards, a little girl, who, while recovering from typhoid, became affected with neuralgia of the forehead and temple; pure tincture of iodine failed in relieving the pain; M. Bouchut ordered the brow to be painted over three times a day with a solution of half a drachm of sulphate of morphia in half an ounce of tincture of iodine, and a cure was effected in the course of three days. The professor adopted the same method of treatment in the case of a lady, aged fifty-two, suffering from interscapular neuralgia, symptomatic of chronic pulmonary disease. Neither pneumothorax nor acute pleurisy were present; the pain was entirely caused by neuralgia of the second pair of intercostal nerves, and was especially intense in the neighborhood of the sternum and along the edge of the scapula. Morning and evening the sedative tincture was applied to these regions, and on the second day amendment set in, and the neuralgia was altogether removed on the fourth day."—(*Jour. de Méd.* and *Dublin Med. Press.*)

"*No Front Teeth.*—The editor of the Adams *News* tells of a musician, a neighbor of his, who recently undertook to trade cows with a certain neighbor H., but after some bantering, H. told the musician that his 'old cow wasn't worth a song, she was so old she had no front teeth on her upper jaw, and couldn't, therefore, eat young grass' Singing friend laughed, looked wise, and went off whistling 'Dunkee.' But the remark of H. had preyed on his mind, and he accordingly went and examined old brindle's mouth, and to his horror and surprise he found she was entirely destitute of upper front teeth! Angry at the supposed cheat, he drove old brindle two miles, to the house of the man he had bought her of, through a driving rain storm, with the mud ankle deep, and after berating the surprised farmer for selling him such an old cow, demanded his money back at once. As soon as he could get a word in edgewise, the farmer told the angry man that cows never wore such teeth on the upper jaw, and to convince him, took him out to the barn yard, when, after opening the mouths of a dozen or so cattle, young and old, the singing man drove old brindle into the road, and trudged home behind her, a wiser man."

["The above shows the utility of general knowledge, even to a musician. The study of nature in any of its diversities is useful to every man, no matter what his vocation may be. We think the man who

travels through the country and does not know more than half a dozen kinds of trees, or does not know wheat from rye, or oats from buckwheat, or potatoes from tomatoes, when growing in the field, loses much of the real pleasure of traveling. But he who knows every flower by name, every plant and shrub, every rock and every tree, every kind of animal, bird, and insect, finds nature populous with objects of interest, and it becomes to him one round of gratification and delight. It requires but little study of the animal kingdom to learn that those animals that chew the cud—the ox, the deer, the sheep, the goat—have no front teeth."]—(*Am. Phrenological Jour.*)

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Force.—"Physical research has shown us that when we develop a given force or vibration, for instance that called electricity, we can obtain, according to circumstances, a vibration called positive electricity, or a vibration called negative electricity, the properties of which are opposite, and neutralize each other. So, again, with light, we can obtain at will vibrations of light which neutralize other vibrations, and so produce darkness. The same occurs with sound; with one kind of vibration we neutralize another, and produce silence. As regards heat it is probable that such will also be found to occur when experiment has been brought to bear upon this subject, for heat appears to follow laws closely analogous to those of light, electricity, and sound. In the present state of science these phenomena are referred to waves, or undulations of matter. If the waves be of equal or multiple dimensions, the effect of the undulation is increased; if, on the contrary, the undulations do not correspond, they interfere with each other, and in certain circumstances neutralize each other completely, just as when we oppose to a body in motion a body moving in a contrary direction with the same mass and velocity. The same state of things exists for chemical action, and we find for the chemical elements a positive, a negative, and a neutral condition. It is simply in order to fix our ideas that we call one of these vibrations positive and the other negative. We have thus:

Positive.	Negative.	Neutral.
Electricity	Electricity	Electricity.
Light	Light	Light (darkness.)
Heat	Heat	Heat(?)*
Sound	Sound	Sound (silence.)
Motion	Motion	Motion (repose.)
Magnetism (N.)	Magnetism (S.)	Magnetism.
Affinity	Affinity	Affinity.

"And if we admit the theory of the mutual correlation of physical forces, the only difficulty that meets us is this—How does it happen that one of these forces or vibrations can become transformed into another? To which I answer, simply by a change in the length of wave. Let us suppose that when heat is developed in a body the molecules of this body are submitted to vibrations in number a per second; by forcing this body to make more and more heat vibrations there comes a moment when a certain number of molecules execute vibrations in number b per second, and light is developed. In the same manner the number of vibrations per second, or in other terms the length of wave, may change

* Cold (?)—Z.

in certain circumstances to produce electricity, chemical action, sound, etc."—(DR. T. L. PHIPSON, *Chem. News.*)

"*Creosote.*—Sparingly soluble in water. Miscible in all proportions with alcohol, ether, bisulphide of carbon, naphtha, eupion, acetic ether, and acetic acid of 1·07 sp. gr. It is only partially soluble in ordinary acetic acid. (Gorup-Besanez.) When pure, it is entirely soluble in ordinary acetic acid. (Vœlckel.) Soluble in sulphuric acid, with combination. No more soluble in dilute chlorhydric acid than in water. Soluble in 80 pts. of cold, and 24 pts. of hot water.

"Soluble in 80 pts. of water at 18·75°. (Abl. from *Œsterr. Zeitschrift für Pharm.*, 8, 201, in *Canstatt's Jaresbericht, für* 1854, p. 75.) Creosote dissolves, especially when warm, phosphorus, sulphur, selenium; oxalic, tartaric, citric, boracic, and stearic acids; the fats, resins, and coloring matters, (as cochineal, dragon's-blood, santal-red, santal-yellow, orchil, madder-red, and saffron.) When warm, it dissolves indigo. When hot, it dissolves many salts, which separate out again as the solution cools; for example, many acetates and chlorides."—(*Extract from Dictionary of the Solubilities of Chemical Substances, by* F. H. STORER, *Am. Journ. of Pharmacy.*)

"*Glycerin.*—Hygroscopic. Miscible in all proportions with water and alcohol. Insoluble in ether.

(*Hydrated Oxide of Glyceryl* or *of Lipyl.*)

$$C_6H_8O_6 = C_6H_5O_3,3HO = \left.\begin{matrix} C_6H_5 \\ H_3 \end{matrix}\right\} O_6$$

Soluble in water. Also soluble in absolute alcohol, from which it is partially precipitated on the addition of an equal volume of ether. (Berthelot, *Ann. Ch. et Phys.*, (3.) 43, 262.) A small quantity of ether does not precipitate glycerin from its alcoholic solution, although it is insoluble in ether alone. (Wurtz.) Glycerin is not miscible with the fatty oils. (Parrish's *Pharm.*, p. 324.) Soluble in cold fuming chlorhydric acid. * * * * * * * *

"Glycerin approaches very nearly to diluted alcohol in its solvent power. It dissolves all deliquescent salts, several metallic nitrates, chlorides, and sulphates, the alkalies, and several of the metallic oxides, as oxide of lead, in large quantities; it also dissolves many vegetable acids. (Pelouze.)

"The solvent power of glycerin is between that of water and of alcohol. In general terms, substances may be said to be more soluble in glycerin the more soluble they are in alcohol. A high temperature greatly increases its solvent power. (Parrish's *Pharm.*, p. 236.) Most of the GLYCERIDES are insoluble, or but sparingly soluble in water. The compounds of glycerin with *baryta, lime,* [see Oxide of Calcium,] and *strontia,* are soluble in water, from which carbonic acid does not precipitate them: they are also sparingly soluble in alcohol."—CHEVREUL. (*Ibid.*)

"*Gutta-Percha.*—Insoluble in water or alcohol. Soluble in ether, caoutchin, and coal-tar naphtha. (Page, *Am. J. Sci.*, (2.) 4, 342.) Insoluble in boiling alcohol. Readily soluble in boiling oil of turpentine. Soluble in naphtha and in coal-tar. (Oxley, *Am. J. Sci.*, (2.) 5, 440.) Soluble in benzin. (Mansfield, *J. Ch. Soc.*, 1, 261.) Insoluble in water, alcohol, oils, alkaline solutions, or in chlorhydric or acetic acids. It softens and partially dissolves in ether, essential oils, and coal-tar naphtha.

Its best solvent is oil of turpentine. Concentrated sulphuric acid slowly chars it; concentrated nitric acid also gradually oxidizes it. (Solly, *Rep. Br. Assoc.*, 1845, 32.)

"Soluble in pure chloroform, in bisulphide of carbon, in rectified oils of turpentine, resin, and tar; also in terebene, chlorhydrate of terebene, and, slightly, in pure ether. Of these solvents, the two first mentioned are the best, and dissolve the gutta-percha at low temperatures. The other solvents act only at temperatures above 21°, and when the solutions obtained are cooled much below 16°, the gutta-percha is deposited as a granular mass. The length of time required to produce this precipitate depends upon the degree of cold; sometimes it requires several days, at others the exposure of an hour suffices to produce it. From its solutions in chloroform and bisulphide of carbon, the gum may be recovered in its natural state either by evaporating or by precipitating it with alcohol. But when any of the hydrocarbons are used as solvents, a portion is retained with such tenacity that it cannot be removed without decomposing the gum. Solutions of gutta-percha are precipitated by alcohol. Ether also precipitates it from the solution in chloroform. Crude gutta-percha contains a small portion of a soft yellow resin, soluble in alcohol, ether, and oil of turpentine. (Kent, *Am. J. Sci.*, (2.) 6, 246.)

"Insoluble in dilute alcohol; traces of it are dissolved by strong alcohol. Only about 0·15 to 0·22 p. c. of it is soluble in hot alcohol or ether, (anhydrous.) Soluble in cold bisulphide of carbon, and chloroform. Sparingly soluble in warm, insoluble in cold olive-oil. Partially soluble in cold, almost entirely soluble in hot benzin, and oil of turpentine. Unacted upon by solutions of the caustic alkalies, ammonia-water, saline solutions, carbonic acid water, or the various vegetable, and dilute mineral, acids. Unacted upon by fluorhydric acid, it is attacked by concentrated sulphuric, chlorhydric, and nitric acids. (Gerhardt's *Tr.*)

"Payen finds in gutta-percha several resins, [see under RESINS,] and

"*Pure Gutta:* which is insoluble in alcohol or ether. Soluble in cold chloroform, and bisulphide of carbon; and in warm benzin, and oil of turpentine."—(*Ibid.*)

"*Casein Cement.*—DR. WAGNER recommends the employment of a cold saturated solution of borax or of silicate of soda, to dissolve casein, in preference to the alkaline carbonate indicated by Braconnot. The solution of casein by borax is a clear liquid, of viscid consistence, more adhesive than gum, and able to replace in many cases strong glue. Stuffs of linen and cotton impregnated with this solution can be treated with tannic acid or acetate of alumina, and rendered impermeable. Marsden, in his *History of Sumatra*, has shown that the chief cement employed in that country is made from curdled buffalo's milk, and called *prackee.* To prepare it, the milk is abandoned to itself until the cream becomes butter, which is removed by a spoon and washed with water for use. The residual liquid of the milk is sour and thick, and it is this that they call *prackee.* They press it strongly, so as to get it into the form of cakes, which are dried, and become excessively hard. When it is to be used, a certain quantity is scraped off, mixed with quick-lime in powder, and moistened with milk. The cement thus obtained is extremely solid, and resists perfectly hot and humid climates a great deal better than glue; it is specially good for cementing porcelain."—(*The Technologist* and *Journ. de Chim. Med.*, from *Amer. Journ. Pharm.*)

THE

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ORIGINAL COMMUNICATIONS.

PRACTICAL HINTS.

BY J. D. WHITE.

Diagnosis of Toothache.—To find out what causes pain in the teeth sometimes taxes the judgment of the dentist to a vast extent—whether it be from inflammation of a pulp or the alveolo-dental membranes. Because in one patient the slightest irritation of the periosteum is a cause of pain, while in another considerable inflammation of a pulp may exist without undue pain; hence precisely the same expressions of suffering in one patient may not lead to the same results in another. We must first bring into view what the temperaments of the patients are, and how they estimate pain. One patient will tell you that the pain is *intense;* well, you must judge of the expression proportionately as it corresponds with your opinion of the pathological condition of the parts supposed to be involved and the patient's view of what intense pain is. Under such circumstances a dentist must strive to become not only master of his business, but master of his patient. It is not unfrequent that a patient who has always been master of his own affairs at home will attempt to be so in the dentist's office, and it is a very nice point for a dentist to act so as not to be governed by his patient without being rude or cause offense. He must be careful to put a proper value on all the patient says, and not to trap himself into error by a disregard of what he says, because while he is partly wrong he may be partly right. The dentist must be careful to properly interpret the incongruities of his patient's explanations and the complicated symptoms attending his suffering, so that a correct diagnosis may be drawn from both.

These suggestions will be useful under all circumstances in a dentist's intercourse with his patient; the better plan is to preserve the habit of instructing the patient rather than contradicting what he may say.

Case 6 will help to illustrate, from my diary, March 29th, 1851: Miss W., a lady of twenty-five, called to consult us, suffering from pain of a lancinating character in the region of the left superior front and lateral incisors. The front tooth was dead, had been for many years, but was not decayed; was very much discolored; the patient had no recollection about it except that it was discolored a long time. The tooth was loose; gum somewhat inflamed; a little fuller than normal, and rather more purple than the gums in other parts of the mouth. The parts presented a morbid appearance. We advised that the tooth should be drilled open on the back part. This was done; an offensive odor escaped from it; we washed it out to cleanse the part and then applied creosote on a small portion of cotton, but not so tightly as to prevent the escape of gas or other substances which might accumulate. Instructed the patient to return in a few days, but if the pain was to become more severe, to return the next day. The patient returned the next day; had suffered pain all night, and could not apply cold water to the mouth if it touched that part. Well we knew that a dead tooth was not painful to cold water; this led us to suspect inflammation of the pulp of the lateral incisor, although in other respects perfectly sound. We proposed to drill this tooth also, but the patient objected; notwithstanding we assured her that a dead tooth was not painful to cold and we never knew of a case of severe inflammation of a pulp to recover, still the patient could not consent to let a beautiful and sound tooth be drilled to kill the nerve and get it as badly discolored as the front one. This was all natural as far as the patient was concerned. We said to her she might let it go another day, but in all probability it would become inflamed in the socket and extremely sore to the touch; if so it would be difficult to drill it open. It was let go over another day, when it became, as we predicted, extremely painful to the touch. The patient called and readily consented to the drilling, although it was very sore. The pulp was nearly all dead; there was some pus and blood discharged from it. We did not apply anything, because we regarded the vent to the pulp cavity as sufficient to relieve the pain, and when the inflammation of the external membranes became less, we could more successfully treat the remaining portion of the pulp if it did not all slough, as is sometimes true in such cases. In a few days the tooth lost its soreness to the touch, the fragment of the pulp was treated, and in due time the roots of both teeth were plugged. This tooth did not discolor, and up to this time there never has been any suffering in either of them. Perhaps we might remark that the inflammation of the front incisor caused the pulp of the lateral to become inflamed from the apex of the root until it involved the entire pulp, in the same way that it becomes so when tartar extends too low down the roots of the teeth.

(To be continued.)

OBSERVATIONS ON THE LESIONS OCCASIONED BY THE COMING OF THE WISDOM TEETH.

BY ABR. ROBERTSON, D.D.S., M.D.

(Concluded from page 248.)

The next case, though rather an anomalous one, clearly demonstrates the view here taken. It also is related by Dr. Trudeau.

Case.—"In this case the right cheek was swelled to an enormous size, the swelling extending from the eye to the clavicle. The face and neck were covered with numerous abscesses. For twenty months the man had not been able to open his mouth, and had been fed on liquids, passed through an opening caused by the loss of a tooth. He had, besides, a fistula at about three inches from the angle of the maxilla. A little lower on the neck there was another. A probe being introduced into the first fistula, penetrated obliquely, from before backward, and was stopped by a hard body, supposed to be the root of the third large grinder.

"From the beginning of the affection the man's health had been greatly impaired; he was much emaciated; his skin was of a leaden hue, and he suffered much from colic. For a short time past his digestion had been disordered, and attended with acidity; this probably depended on the mixture of his food with the pus, with which his mouth was constantly filled. Various means were resorted to, to open the patient's mouth. Leeches, poultices, mercurial frictions, blisters, and compresses were used with no better success. Dr. ——— now thought of trying a mechanical agent, which succeeded perfectly. It was a conical piece of wood, introduced between the dental arches, and pushed in slowly by the patient himself. The following day the mouth presented an opening of about four lines. A week afterward the man's mouth was opened enough to allow of the tooth being easily extracted.

"A few days after a piece of necrosed bone was extracted. It proved to be a portion of the base of the coronoid process, on which was moulded or cast a portion of the crown of the tooth. This evidently showed that the tooth had been stopped in its growth by this bone. Since that time the inflammation rapidly disappeared; in a month the patient was perfectly cured."

Robert Crawford, M.D., reports the three following cases in the *London Lancet*, vol. ii. for 1857:—

Case.—"R. S., by occupation a coachman, footman, etc. for an old gentleman, called upon me two years ago to get something done for a sore on the centre of his left cheek. He said it had been a boil, which suppurated and broke, about two months previously. His face was much swollen, and, as he had to wait at his master's table, it rendered him unfit

for his work. The patient had consulted another surgeon, and had tried various remedies, but could not get it healed. He was otherwise the picture of health. I thought it might be some chronic affection of the parotid gland, strumous or otherwise. I gave him some zinc lotion to inject into the opening, and to apply a bit of rag dipped into the same, and covered with oiled silk. In about three weeks he came to tell me that the sore was healed, but his cheek was swollen. I gave him iodine to apply over it. There was an ugly cicatrix where the sore had been. In the course of another month the patient came again, presenting an abscess ready to burst in the old place. I opened it, told him to poultice it for a few days, and then use the former treatment. In about three months he called again, and told me that after he last saw me, being useless in his situation, he went home to Edinburgh, where he saw Professor Syme, who gave him something to use, and that the sore did not heal for six weeks after I opened it. The professor told him that the sore came from a wisdom tooth coming up, for which there was not room in the jaw; and advised him, if the sore did not heal, or should trouble him again, to have the adjacent tooth extracted. His face was now much swollen, and an abscess was evidently forming again. I examined his mouth, and saw that he had got the upper wisdom teeth only, and that there was evidently a want of space below. I accordingly extracted the second molar tooth, after which the swelling gradually subsided, and the wisdom tooth soon filled up the vacant space. He was now permanently cured."

Case.—(J. C.) "Some time before I saw the last case, R. J., a forester by occupation, came to me with a large abscess on the left cheek, about an inch above the angle of the jaw. I opened the abscess, and by using poultices for some days, and water-dressings afterward, the sore healed in about two weeks.

"Shortly after I extracted the tooth from Case No. 1, I was again visited by No. 2. The abscess was now the same as before, but observing the similarity between this case and the former, I examined his mouth, and saw that he still wanted the wisdom tooth in his left lower jaw, for which there evidently was no room, and the gum round about was a good deal inflamed. It so happened that a year or so before he came to me with the first abscess, I had extracted the second molar tooth in the right lower jaw for toothache, the place of which was now filled up by the wisdom tooth. I now extracted the same tooth on the left side, when the abscess broke into the mouth, and the wisdom tooth replaced the removed one as before. He has not been troubled since."

Case.—(J. C.) "A. T. consulted me four months ago for a swelling on his cheek. I saved this patient from having an ugly cicatrix, as the other two unfortunately had, and will have as long as they live."

On the course of treatment pursued in these cases I deem it expedient here to make one or two remarks:—

First. When abscess has formed in the cheek, whether from causes such as just described in connection with the wisdom teeth, or from caries of these, or of any other class of teeth, if the case is seen before the abscess has broken, it should be opened, and freely too, on the inside of the cheek—within the mouth—which avoids the unsightly scar that otherwise occurs. *Second.* As a general rule, a better plan of treatment is to take out the offending wisdom tooth rather than the second molar, which is usually a larger, stronger, better, and more durable tooth. This can generally be done, with a properly-constructed elevator, without much trouble. I have repeatedly taken them out when the whole crown of the tooth was below the gum, and I have also succeeded in taking them out when the jaws were so much closed by swelling that the incisors could not be separated more than the fourth of an inch.

The result of extracting the second molar, as described in the foregoing cases, however, explains how the treatment, which I have seen recommended in our dental journals, in so many articles, for what is called "lateral pressure," sometimes affords relief, *i.e.* the filing of spaces between the teeth. They, to some extent, remove the obstruction to the coming of the wisdom tooth, and thus relieve the pressure of the point of its root upon the nerves; *while, at the same time, it would practically increase the difficulty, if lateral pressure were the cause of trouble, by allowing their necks and fangs to come in closer contact, and to impinge more strongly upon the intervening membranes and alveoli.* A surer and a better way is to remove the wisdom tooth, for if filing the teeth would, with equal certainty, relieve the present difficulty, teeth thus filed are very apt—almost certain—to decay.

After having digressed so far, I shall close my remarks on this subject with the history of one more remarkable case of irritation from the coming of a lower wisdom tooth, the effects of which were manifested in a very remote organ.

R. Davis, Esq., M.D., C.S., London, reports the following case in the *London Lancet*, and it was copied by the *Medical Examiner* of 1846, and also by *Braithwaite's Retrospect* of that year:—

"*Case.*—Neuralgia of the uterus arising from dentition. Mrs. S., of Shoreditch, a lady of full habit, and twenty-five years of age, was delivered of a male child on the 3d of September, 1844. * * * * With the exception of some fainting, and a few after-pains, everything went on favorably until the sixth day after delivery, when she was attacked with pain of a severe character in the region of the uterus. There was no fever, no heat of the skin, no derangement of the circulating or digestive systems, and no increase of pain on pressing the abdomen. For the relief of this pain, opiates and other sedatives were freely administered, both in solid and liquid forms, without benefit.

"We may here observe that, although the pain was of a most severe character, it was intermittent in its attacks, and during the intermission pain was referred to the face, but not considered of such consequence by the patient as to inform me of the circumstance. The pain of the abdomen continuing, and fearing that this irritation might terminate in inflammation, leeches, fomentations, mustard plasters, bran poultices, and blisters were applied, and a pill consisting of one grain of opium and two of calomel was administered every three hours. The pain in the face now became more severe, and the patient supposing it to arise from toothache, surrounded the parts with flannel. This circumstance led to inquiries on my part, which ended in an examination of the mouth, where I found the posterior part of the gum enlarged, red, and swollen. The mystery was explained. One of the dentes sapientiæ, the cause of all the pain in the uterus, was coming up; the gum was freely lanced, and the pain in the uterus, from that moment, subsided. No more medicine was required or given."

I have now, (in this and preceding articles,) as I proposed in the outset, illustrated by many well-marked cases that a great variety of diseases, and many of them of a very formidable character, are directly produced by irritation connected with the teeth.

I have especially shown that diseased teeth are a most fruitful cause of indigestion, and almost all authors place disturbances of the digestive functions among the most prominent exciting causes of many other diseases, as consumption, diseases of the heart, liver, brain, and other organs; and if diseased teeth are the common direct cause of disturbance of the digestive functions, they may be, at least, the indirect cause of almost all other kinds of disease.

This may be my hobby; still this, at least, will be admitted—the cause of a large share of all diseases depend, in some way, for their origin, either upon unwholesome or badly-digested food, upon miasmata, or nervous irritation, all of which indications diseased teeth fulfill, therefore many of them may be caused, developed, or aggravated by the vitiation of the food, by the miasma, or by the nervous irritation produced by diseased teeth, and that it must be safe practice in the treatment of most diseases, and judicious prophylactic treatment as well, as far as may be, to remove all sources of nervous irritation and depression. And I will hazard the opinion that the teeth and their appendages are the seat and cause of more nervous irritation than any other part of the organization; and that, if medical gentlemen, when investigating the nature and cause of disease, will make it a point carefully to examine the condition of the mouths, and especially the teeth of their patients, they will there find a far more fruitful source of disease than some, at least, imagine.

WHEELING, W. VA.

GLEANINGS FROM PROCEEDINGS OF THE SOCIETY OF DENTAL SURGEONS OF THE CITY OF NEW YORK.

BY J. S. LATIMER, D.D.S.

On the subject of the nitrous oxide and its employment in dentistry, Prof. Vanderweyde said the crystallized nitrate of ammonia has this advantage over the fused, less of the nitrate is carried over from the retort; but the fused, having no water, causes less waste of time.

He claimed that the protoxide of nitrogen (NO) owes its effects upon the system not to the oxygen it contains, but to the union of both. If another equivalent of oxygen be added to air, the effect is only a slight irritation of the lungs and fauces. That the nitrogen is also consumed he deemed proved by the fact that, after inhalation, less bulk of mixed gases remains in the bag than was formerly occupied by the nitrogen alone.

He was having constructed an instrument which would accurately measure the gas consumed and that eliminated from the lungs.

Dry oxygen and nitrogen mixed will not unite chemically, and hence produce no intoxication; they must be in the nascent condition to combine.

He said the gas could not be retained very long in rubber bags nor over water, on account of the interchange by endosmosis. At the end of a few days the receiver will contain air and not gas; but, as the gas passes through to the air faster than the air passes in, the volume in the receiver will be considerably reduced. All water, except it has been very recently boiled, contains air, and this is richer in oxygen than dry air. The nitrous oxide, like oxygen and most gases, may be kept in glass bottles with ground stoppers. Concerning retorts, he said the best glass ones are Bohemian, but porcelain would be found most economical in the end.

If, in generating the gas, too high a heat be used, NO_2 will pass over, and, on contact with air, will take up two equivalents of oxygen, and become NO_4; but this is soon absorbed by the water. Atmospheric air is merely a mechanical mixture, of which the nitrogen is only a diluent; nitrogen and hydrogen may be breathed with impunity, but they will not support life.

Oxygen is called a supporter of combustion, and so it is; but if a jet of oxygen be ignited in a jar of hydrogen, the hydrogen becomes the supporter of combustion.

He performed interesting experiments with hydrogen and a tube terminated by a porous earthen cup, with which he explained endosmosis. When administering the gas, (NO,) at each exhalation the gas in the bag is rendered impure and diluted with the carbonic acid eliminated by the

lungs. This he proposes to remedy, in the apparatus he is producing, by passing the exhalation through a solution of caustic potassa on its return to the bag.

Some nitrate of ammonia will be carried over from the retort, but it will be absorbed by the water.

Dr. John Allen had lately some considerable experience with the gas, and believes it far preferable for dental purposes to chloroform and ether. It is perfectly safe, easily exhibited, perfect in its anæsthetic effects, and the patient rarely feels the slightest inconvenience in consequence of inhalation.

He has noticed that some patients cry out as in pain, but on awakening they know nothing of either the pain or the outcry; indeed, they made the same manifestations whether touched with the forceps or not. He related a case in which hoarseness was instantly removed by inhaling the gas, and several other interesting cases in which consumptives had been greatly invigorated and benefited by the gas. He deemed it important that the patient should be relieved of all apprehension before inhaling, and to this end he was cheerful, and made as little parade as possible.

Dr. Atkinson had not thought well of the gas, but he now believed, from the testimony he had heard, that for most dental operations it is greatly to be preferred, and this he said while fully aware that not a single *well-authenticated* case of death from chloroform is recorded. He doubted whether the effect of the gas is anæsthetic in the accepted sense; and said that if the mind can be completely fixed upon any one subject or object it will be unconscious to all others.

Dr. Latimer deprecated collecting the gas directly into the bag, even from wash-bottles, as it should stand over water in order that the impurities may be absorbed. (A member recommended putting two or three quarts of water into the large rubber bag, which when filled may be shaken, and thus the desired result be accomplished.) He had no faith in American glass retorts. As cold water absorbs nearly its own volume of the gas, he had obviated the necessity of frequently changing the water by using for a pneumatic trough a vessel of sheet zinc, which may be about say two feet in diameter and two or two and a half deep. This will contain the water, while another cylinder—closed at one end—some five or six inches shorter, may have its diameter so as to easily slide up and down in the water-trough. As the gas rises through the water into the receiver, the water is displaced and the receiver rises. As the amount of gas absorbed depends somewhat on the pressure, it will be well to balance the weight of the receiver with a weight attached to a cord running over a pulley. He had met with difficulty in administering the gas in consequence of the imperfection of his mouth-piece, which is round. Air would be taken in at the corners of the mouth, and thus he had failed of the desired results. He had tried to remedy the difficulty by attaching

tissue rubber to the inhaling tube, so that an assistant might thus effectually shut off the air. But he had been shown a mouth-piece by his neighbor, Dr. Starr, which was adapted to the mouth, and, by stretching the lips on a line with their angles, obviated the necessity for an assistant.

Dr. C. P. Fitch said the gas acts as a tonic by oxydizing the red globules of the blood. He believed, by the exhilaration, the mind is drawn from the sense of pain, as it sometimes is by fear or anger.

Dr. Geo. E. Hawes had not used the gas, but a patient of his went to another practitioner to inhale the gas, and accidentally lost a tooth on which had been bestowed a good deal of labor, and which had been made a valuable organ.

Dr. Colton being invited to make some remarks, said that in 1844 Dr. Wells used the gas for about a year, and tried to introduce it among dentists generally, but ether coming into use, and being more easily procured, that and chloroform took the place of nitrous oxide. About a year and a half ago he took his wife to Dr. J. S. Dodge, of this city, who removed some teeth while she was under the influence of the gas. Some three months later he administered the gas to three patients at New Britain, Connecticut, who, under its influence, had teeth removed. About a year later he began administering the gas for Drs. Dunham and Smith, in New Haven, and Dr. Smith in twenty-three days extracted three thousand teeth successfully.

Concerning the manufacture of the gas, he said forty-five gallons of gas can be generated in a half-gallon retort in twenty minutes. If the retort be smaller, more time will be required.

He mentioned several cases in which the gas had greatly benefited consumptives, and said he had seen no ill effects from its use in heart diseases.

On the evening of November 4th Prof. Vanderweyde said he had recently instituted experiments to discover the best fluid over which the gas could be kept. Of all the fluids tried water, to which had been added ten per cent. of sulphuric acid, proved far the best, only a small proportion of the gas being lost. He had not yet tried modifications of the strength of the solution, and would report again at a future meeting. Sulphuric acid would admit of none but glass receivers, but, as it is not volatile, it would not impair the purity of the gas. In order to discover whether our nitrate of ammonia is impure, we must test for the known adulterants.

The presence of the sulphates is known by any soluble salt of baryta. For instance, if, on adding a solution of the nitrate of baryta to a solution of the nitrate of ammonia, the mixture becomes milky, we know we have sulphuric acid as an adulterant. He reddened about two ounces of litmus-water with the carbonic acid of a single exhalation by passing the breath into the solution through a tube. With another exhalation he

precipitated the lime from two or three ounces of lime-water. Water at 60° F. absorbs nearly its volume of the nitrous oxide, while at 120° F. only half as much will be taken up. When first made the gas, unless it has been very slowly and carefully generated and well washed, is unfit for respiration, on account of the hyponitric acid (NO_4) with which it may be mixed; but after standing over water a few hours it is decomposed, and the receiver contains only NO diluted with air.

Dr. Latimer had produced anæsthesia with gas that had been kept over water nine days, and he thought it might be kept still longer.

November 4th. The subject of mechanical dentistry being under consideration, Dr. John Allen said that in the preparation of the mouth he would remove even both the superior canines though sound, if all the other teeth of that jaw should be useless or gone, deeming it better for the patient, inasmuch as the atmospheric pressure would be greatly injured by the apertures in the plate at those points.

If only the superior second or third molars remain and are sound, he leaves them in, because they assist in preventing the piece from being coughed or sneezed out. On the inferior maxilla he leaves whole teeth or even healthy fangs, and sets the plate over them. Such teeth assist greatly in steadying the plate, and permit the force of mastication to fall upon unyielding points. He has derived greater satisfaction from his lower plates since adopting this "capping" method. When he can do so without protruding the lower lip over much, he does not hesitate to cap tolerably long front lower teeth, placing the artificial teeth anterior to them. He recommended giving artificial substitutes a natural rather than a beautiful expression. He had lately left healthy roots in the upper jaw and set the plate over them, but his results were less satisfactory than with lower sets so managed. He is careful to so set the teeth that the force of mastication will fall perpendicularly on or slightly within the arch.

Dr. Wm. H. Allen is in the habit of saving all of the natural teeth that can be saved. He does not hesitate to set plates over *healthy* fangs, and has been well pleased with the results. They are first filled. It is best to carve away the impression slightly over them, so that the plate will rest on the gum rather than on the fangs, for the piece will soon settle to its place, when it will barely touch the fangs.

He uses wax for taking impressions for partial cases, putting it back two or three times to correct imperfections.

Instead of oiling the impression he varnishes it, and then, before putting in the plaster, pours in a little water, the excess of which is then thrown out. By this means the ends of the plaster teeth are much stronger than when oil is used. Clasps he adapts to the crown where the enamel is thick, and thus avoids two objections urged against them,

namely, the wearing of a groove around the tooth and a loose fit of the neck, by which much motion is admitted.

He likes to try his plates in the mouth before attaching teeth, to make sure of proper adaptation, and prefers to see the teeth in the mouth before soldering.

Dr. Kingsley has no trouble with the springing of plates since using an investment of sand three parts and plaster one part. He described a case in which he had rotated a superior central and its neighboring lateral with a single ring of elastic rubber. He made a rubber plate, the anterior portion of which impinged upon the whole palatal surface of the incisors. A slot was made in the plate opposite the anterior approximal (mesial) surface of the central, and another opposite the centre of the lateral. The ring was then passed through the mesial slot, between the two centrals, anterior or around its labial surface, between the deflected central and lateral and through the other slot. It should be remembered that the posterior approximal (distal) surfaces of both teeth presented toward the lip, that the central lay lapped upon the lateral, and that sufficient space existed between the lateral and canine to permit the teeth to take their proper places. The patient was a miss of sixteen. In two weeks the teeth were in position, when another plate was made to retain them in situ.

Dr. Franklin claimed that the error of drying the mass on investment, before applying the flame to prepare for soldering, is universal. If the flame be thrown upon the wet mass, the escaping steam will regulate the temperature so long as any moisture remained; subsequently the change is gradual, and there is less liability to fracture teeth than by the usual methods. He said zinc should be used but three or four times and then sold to a brass founder, as the crystallization is made finer, the shrinkage increased, and the hardness considerably lessened by frequent meltings.

Dr. Kingsley had had considerable experience in putting up block work, and did not think he could heat up a case by Dr. Franklin's method without fracturing the teeth. He first evaporates the water from the mass and then places the case upon fine-grained charcoal, set up endwise in a little sheet-iron furnace of some five inches diameter and as many inches in height. By the position of the coal the burning is more even, and the case does not fall or tip from its position. The heating is gradual, and when the plate is of a dull-red color, he holds the lamp in his left hand and throws a flaring flame upon the case without removing it from the furnace. In order to do this easily, he had the furnace up high enough to enable him to get at it easily.

Dr. Johnson has used and prefers cast-iron for lower dies.

DIAGNOSIS OF TOOTHACHE.

A Mistake in Diagnosis of Toothache.—Epidemic Toothache.—Influenza.—Severe Case of Teething.—Prognosis in Toothache.—Extraction in several Cases.

BY GEO. S. FOUKE, D.D.S.

On opening the Dental Cosmos for December this evening, we became immediately interested in Dr. J. D. White's article on diagnosis of toothache, and the mistakes that are made concerning this malady. The case presented of a colonel in the U. S. army brought to mind the circumstances of a pretty much similar case that occurred with us in the year 1851, soon after we settled in this place. A medical gentleman, over fifty years of age, residing in the country, consulted us about a lower second molar that was the cause of considerable pain. Examination of the tooth satisfied us that the trouble was caused by an occult deposit of tartar under the gum. The tooth was free from decay, and the attachment was yet firm—the tartar having insinuated itself only at a single point on the posterior fang. We declared our opinion; but, to our surprise, the medical gentleman treated our diagnosis with positive derision, and left us. Our diagnosis was too simple. He expected some great thing, and was evidently disappointed. Time rolled on, and one fine day we accidentally came in contact with our friend, who drew from his pocket this same molar tooth, and addressed us in the following manner: "Here is that tooth; I want you to see it. I got Dr. ——, dentist, to look at it, and he found that the tooth was affected with *necrosis* of the fang, and said it could not be extracted too soon. Look at it; did you ever see anything like it?" Often, sir, we replied. This dark, hard matter on the root is simply a deposit of tartar; and to prove it, we were about to remove it with our penknife, when the medical gentleman requested us not to cut at it, as he wished to preserve it as a remarkable specimen of *necrosis* of the fang. Whether the doctor has ever found out that he was *mistaken* or not, we never troubled ourself to ascertain. "Where ignorance is bliss," etc.

We believe Dr. White was the first to speak of toothache as being at times *epidemical*, owing to some unusual changes in the temperature and weight of the atmosphere. We have noticed this phenomenon several times in our dental life, and we are just now experiencing the prevalence of toothache as an *epidemic*. The doctors have their hands full just now with a prevailing influenza; not by any means the old *Tyler grip*, but a modified form of *catarrh* fever, mild and readily managed. This influenza seized at once upon our whole family, among whom was our infant, aged seventeen months. Unfortunately for the little innocent, he was just cutting his two inferior cuspidati teeth, and there were symptoms of a very

threatening character. The disease became complicated with inflammation of the brain, and we feared a fatal result. But the case terminated favorably, and the little fellow is now getting well. It is our habit to cut the gums for our children when teething; and in the case of this one, we made free use of the gum-lancet during his attack, and we believe with great benefit.

We wish to notice a few cases of toothache, and the treatment during the epidemic. Our object in directing attention to them is, to touch on the importance of not making mistakes in what may be called the *prognosis* of toothache. It is evidently the duty of the dentist to decide what is likely to be the fate of an ailing tooth, and to extract only when extraction is the best mode of treatment. Yet we feel sure that the sufferings occasioned by an offending tooth are oftentimes aggravated and prolonged by efforts made to retain the tooth, when the very best thing that could be done would be immediate extraction.

Case 1 was a lad, aged about thirteen years. He came in with a severe inflammation of the alveolo-dental membranes of an upper lateral incisor. The case should be desperate when we decide to extract a front tooth for a young person; yet in this case we decided it to be eminently proper for us to do so, and we removed the incisor in question. Our reasons for extracting this tooth were, that the tooth itself was quite badly decayed, and the external membrane of the root was in a state of great congestion; and secondly, because the canine tooth was crowded partly outside the arch by the bicuspids, which were all good, sound teeth. We believe that the loss of a decayed lateral incisor is more than compensated for in such cases by the good done to the other teeth. We have seen cases treated by us, where the loss of the incisor could scarcely be perceived after a year or so.

Case 2.—A laboring man, from the quarries in the neighborhood, came in with a severe pain proceeding from a wisdom tooth in upper jaw. The tooth was entirely sound, and there could be discerned no signs of inflammation about the gums. We hesitated to pull the tooth, and dismissed the fellow with some remedy for his relief. But he returned after one day for us to take the tooth out, as he said he could not stand the pain any longer. All things considered, we thought it would be best to comply with his request, and we soon had the satisfaction to find the pain vanquished by the removal of the tooth. All the indication of disease apparent was a congested state of the alveolo-dental membranes of one of the roots.

Case 3.—We extracted a lower wisdom tooth for pain in the second molar of the upper jaw. This transference of pain is not rare; but in this case it was, to say the least of it, very *striking*. The upper teeth in which the pain was located were sound, yet the patient insisted that it was the second molar that ached him, and wanted us to extract it. We

discovered, under the gum of the lower *dens sapientia*, a cavity of decay, and it struck us that the pain was caused by this tooth. Its removal put an end to the toothache.

Westminster, Md., December 8th, 1863.

PRIMAL PRINCIPLES.

Read before the Brooklyn Dental Association.

BY C. P. FITCH, M.D.

There are in dentistry, or connected with dental physiology, a class of basal truths which reach back to the forces which produce structure and control function; and from this fact there is a juxtaposition or a blending of the seen and the unseen, the palpable and the mysterious; therefore we should travel in this region, or explore its labyrinths with circumspection and much careful thought, with close critical examination of both premise and conclusion, and with a full realization of the finitude of the powers which we bring into this investigation. All organic matter has wrapt up with it force, which, under favorable circumstances, tends to development. The legitimate function of an organ is materially affected whenever the force controlling it is at all interfered with; and we think all abnormal growths will be found to be the result of arrested normal development or perverted nutrition; and all arrested normal development must be owing either to a defect in the force presiding over it, or to the character of its nutriment as well as to the due appropriation of food and the proper elimination of matter effete.

As one has in substance well remarked, the legitimate function of the mucous membrane is not to secrete mucus; but its healthy and normal secretion is a transparent, watery fluid, which watery fluid is quickly absorbed again; but while unabsorbed is mingled with full-developed, cast-off, or molted epithelium. This watery fluid covers with but slight moisture the surface of all healthy mucous membranes, and protects the less actively-renewed structures beneath from any external violence which is liable to arise from the passage of ingesta. The mucus is ascertained to be composed, partly of homogeneous fluid, but principally of nucleated globules and cast-off epithelium floating in it. The nucleated globules are derived from half-developed, molted epithelium, which produce by segregation and budding other like globules. Hence mucus is filled with these nucleated globules of all sizes and stages of development. The mucus is rapidly produced, generally acid in its reaction, and must be regarded as an abnormal product, derived in the outset from epithelium arrested in its growth and early cast off; but principally derived from a rapid reproduction of these globules by division, etc. Thus it is fair then to con-

clude that all abnormal or diseased action may be regarded as being more rapid in its progress and lower than the normal or healthy type.

The principle of reproduction so fully recognized in surgical practice, when carried to its ultimatum, bears directly upon dental subjects, so far as the renewal of oral tissues is concerned.

Their application in the reproduction of the facial bones is unquestionably the work of the present. To Dr. W. H. Atkinson, of our city, more than to any other living dentist, is due this honor; and he should receive the thanks of the entire profession for so fully developing this very important and valuable feature in dental surgery, a practice fraught with incalculable benefits to those so unfortunate as to require its personal application, which also must carry untold joy to thousands directly and indirectly interested. The doctor has, either wholly or sectionally, in numerous instances reproduced the palatine, the superior and inferior maxillary, and the palatine processes of the superior maxillary bones; also, sections of the os frontis. By inducing a new formation of bony structure around the roots of the natural teeth thus rendered loose and useless by the loss of this structure, such teeth have been made again firm and healthy; but in case of their extraction, either through ignorance or design on the part of those who claim authority and standing by reason of their connection with the dental profession, and who are expected to be conservators and not destroyers of dental tissue,—I say in case of the loss of the teeth with the facial bones, there has been bony substance reproduced to subserve well the purposes of a base for artificial denture.

The renewal of tissue is a basal truth in surgery, and has been operative in every instance of recovery from injuries inflicted, either by accident or design, from time immemorial, whether recognized or not by the surgeon. Sections of the humerus, and of bones of the forearm, of the femur, tibia, and fibula, and, in a few instances, sections of the inferior maxillary have been reproduced by surgeons in this country and Europe.

An instance, not long since, was reported in one of the medical journals, where the entire inferior maxillary bone was reformed under proper surgical care. The only thing singular about this matter is, that these principles were not long ago applied by the dental profession for the reproduction of the bones of the face. It is clear to my mind that any bone of the human organism is susceptible of reproduction, provided the plasm producing the structure is produced, retained, and properly protected from all malign influences to which it may be exposed during the reformative stage.

A discussion of the treatment requisite to the production of healthy exudate or plasm is foreign to my present purpose. But that the facial bones may be reproduced, and that this fact is established beyond controversy; that conservative and not medical surgery should be employed

in every instance possible by the dentist for protection and not devastation, for reproduction and not destruction; that the dental practitioner, by superior qualifications, should command the recognition, and be regarded as the legitimate dental surgeon; and that a rapidly-educated community will soon demand the requisite qualifications on the part of this class of surgeons to meet such indications, are points which I particularly desire to call up, and press upon your attention, this evening.

With this purpose subserved, I close this paper with a few thoughts on the use of the nitrous oxide as an anæsthetic for the extraction of teeth. Its general adoption into dental surgery is of quite recent history, although its anæsthetic properties were ascertained and put to the test by Mr. Horace Wells, of Hartford, Conn., as early as 1844, in the extraction of teeth for himself and numerous friends.

That it may be used successfully and safely for this purpose, there can be no doubt. But the great danger is, that thousands will rush to the altar of this dental Moloch, and desire an operation which involves an irreparable loss, simply because relief from pain may be secured without its further infliction. It is just at this point that the intelligent and conscientious dentist should lift up his voice like a trumpet, and instruct the people a better way. Extraction is, indeed, a rare necessity; and he who does not come up to this enlightened standard of advanced dental excellence, should be made to feel that he must inevitably suffer in reputation, and if not immediately, yet remotely, he must in finance.

New York, November 27th, 1863.

HOPELESS CASES.

BY WM. H. ATKINSON, M.D.

There are two classes of operators who undertake these, viz., those who understand the physiology and pathology involved, so thoroughly as to enable them to accomplish marvels in the way of restoration in cases that would be dismissed as beyond all remedial measures by the great mass of practitioners. Those in possession of such knowledge and ability are not sufficiently numerous to use the term "we" in each town or city in the United States of 20,000 population; possibly not where the inhabitants are multiplied by five times that figure.

The second class is composed of inexperiened geniuses who assume to do whatever "any other man" *can* do. These also are few as compared with the whole number of practitioners. The best examples of the first class never fail to accomplish their purposes where they have entire control of the cases; while the poorest examples of the latter class as universally fail to attain the end desired in the premises.

It is a great comfort that no one is doomed to remain in the latter

category; that the door is open for all to accomplish the highest results, or to direct the patient to those possessed of the necessary perception and skill. Whenever we deny the stimulus of hope of success in even the most desperate cases, we effectually block the wheels of the car of progress. And if no one shall be confided in as efficient until he has demonstrated his ability in a series of successes, where is the encouragement for even the brightest genius, or the clearest perception of principles upon which alone all ultimate full success depends?

The ever-present burning desire of the man of genius to do good in his day and generation to those within his reach, has in all the past been the sure prophecy of the good time coming, in which the good intent of the heart shall be wrought out by the works of the head and hand in the proximate restoration of all lost or abnormal parts of the human economy.

The time was, not long since either, that there was "no hope for teeth with exposed pulps;" and the time *is*, when less than a decade of dental surgeons dare regard as "hopeful" necrosed alveolar processes, malar, and jaw bones. And demonstrations, thank a kind Providence, are multiplying yearly in no insignificant numerical strength.

At the suggestion, and by the *request*, of Dr. R. H. McDonald, of Sacramento City, Cal., I propose to give the statement of his own case, which was regarded as "hopeless," so far as restoration and retention of the six upper front teeth were concerned, by the best skill on the Pacific slope of the Rocky Mountains. Fig. 1 shows the condition of

Fig. 1.

the upper maxilla at the time he presented for advice. It will be perceived, by close inspection, that the pulp was dead in the left superior lateral incisor, upon which an alveolar abscess was discharging at the time

from a fistula one-fourth of an inch from the margin or festoon of the gum between it and the canine. Both canines, the right lateral, and both central incisors had living, healthy pulps, although, as will be perceived, worn down to the junction of the lower and second quarter of the bodies of their pulps, which had been protected in the first place by consolidation of the dentinal tubules, and next by calcification of that portion of the pulp properly occupying the coronal distal fourth of its chamber with well-organized secondary dentine. Retaining points were carefully excavated, between the enamel and supposed position of the still living pulp, sufficiently deep into the solid dentine to secure a hold strong enough to justify "hope" of success in the end by firmly anchoring the basis of the filling into these anfractuosities, upon which to build solid gold fractional crowns, thus restoring the *five* living teeth to approximately normal shape, size, and length, upon which to receive the force in the occlusion of the inferior natural living and healthy teeth. This was done, as *all* my fillings are, by the use of the mallet.

I carefully enlarged the pulp canal of the left lateral incisor, upon which the abscess was, nearly to the end of the fang. In doing which, I discovered that a portion of its length had been already enlarged, previous to my seeing it, quite as much as its size and strength would safely admit. Also, that instead of following the course of the canal, the instrument had passed out of the fang into the periosteum and external plate of the process, causing the fistulous opening from which the pus and sanious exudate were discharging.

Fig. 2.

This fistula was treated with solution of iodine in creosote until no further periostitis was perceptible, when a very small pellet of cotton wet

in creosote was carried up past the old divergent artificial canal into the extremity of the enlarged natural canal in the fang, against which gold was securely packed and the crown restored, as is seen in Fig. 2.

Four weeks subsequently to filling this tooth, the fistula was completely obliterated by organized, colorless, or faintly-bluish plasm. It is now a little over six weeks since the completion of the filling, and two, since complete closure of fistula, and the cicatrix is reddening a very little with new blood-vessels.

I know of only two who are doing this sort of work according to the above delineations; and it was with both of them clearly and cleanly original without collusion with each other, or the knowledge that any one else had even attempted it. I refer to Dr. W. H. Allen, No. 18 West Eleventh Street, New York.

I wish also to state here that I owe much of the ability and perfection of my operations to the experiments and practices of W. H. Dwinelle, M.D., of No. 119 Tenth Street, New York, who, for aught I know, may have done just such work as described in this paper. One thing I am confident of, he possesses the ability requisite to its performance.

My object in the publication of this case is: first, to accommodate the desire of Dr. McDonald to extend the usefulness of our profession by putting upon record the fact that even such "hopeless cases" as this may be rendered comfortable and efficient for their normal services in the system with much less of inconvenience than would be supposed by the majority of the profession or people; secondly, to inspire the whole body of competent workers in our responsible sphere of activity with the determinate purpose to *do all* their kindly natures *desire* to effect for the many "hopeless cases" that have hitherto been set aside on one pretense or another of the practitioner or patient without *proving* the extent of ability resident in more than a moiety of those now engaged in filling teeth.

NEW YORK, December 5th, 1863.

PROCEEDINGS OF DENTAL SOCIETIES.

PROCEEDINGS OF THE ODONTOGRAPHIC SOCIETY OF PENNSYLVANIA.

A MONTHLY meeting of the Odontographic Society was held on Tuesday evening, December 1, 1863, in the Philadelphia Dental College.

Vice-President, Dr. Kingsbury, in the Chair.

Dr. McQuillen, the Corresponding Secretary, presented a communication, which he had received a few days before, from Dr. J. F. Vegas, a corresponding member of the Society, residing in Bahia, Brazil, com-

prising a translation of an editorial from the *Diario da Bahia*, favoring the establishment of a department devoted to dentistry in the University of Bahia, along with the application made to the trustees of the institution for the establishment of the department. It is as follows:—

"Friendly as we are to those ideas which may by their good results bring great advantage to scientific progress, we cannot fail to applaud with enthusiasm all and every improvement for the benefit of the people.

"By reason of the reform of the medical schools, the government has comprehended that it had become needful to raise up men who might dedicate themselves to the specialties of the different branches of which the medical course is composed, and the views of the government were magnificent, for it sought not merely to prepare practitioners of acknowledged merit, but to instil into the youth the progresses along which these different branches of the science are marching.

"Among us, however, encyclopedism is exacted of the medical man; the public considers that the doctor should be operator, accoucheur, and dentist, because the diploma of doctor of medicine confers on him the profound knowledge of all the scientific branches, and woe to him who limits himself to the exercise of this or that specialty, and for this reason refuses to undertake an operation of another class when called on. France and England think differently. Ricord, Nélaton, Denonvillier, Desmares, Velpeau, and Dubois are specialists; and certainly it cannot be disputed that these great intellects are each exercising, however, a specialty.

"These observations were suggested to us by reading the considerations, published below, offered to the Ex. Sr. Counselor, Director of the Faculty of Medicine of this city, by Dr. J. F. Vegas, showing the necessity for the creation of a special chair of dental surgery in that school.

"This improvement, with the conditions which Dr. Vegas presents, is of incontestable advantage to the alumni of our faculty.

"The United States, Prussia, Germany, and, we believe, even Portugal have accepted it.

"Diseases of the mouth ought to merit a serious study on the part of the observer. Among us, with some honorable exceptions, dental surgery is given up to empirics, who know this art only by practice, and that badly.

"Who is ignorant of the fatal consequences that have followed the extraction of a tooth by a mere tyro? The medical journals enumerate facts of individuals who have suffered from fistula, caries, and necrosis of the maxillæ in consequence of a bad extraction, and even poisonings by the application of copper plates. How many evils have not been produced by those *famous* barbers who hang at the doors of their houses the symbolical razor, towel, and basin!

"The government has recognized so far the utility of the study of surgical dentistry, that we are told it has ordered the dismissal from some of the military hospitals of the employee charged with the extraction of teeth, obliging the surgeons of these establishments to practice these operations.

"In our schools this study is entirely ignored, and, reflecting on the advantages that our youth may gather from it, we thank Dr. Vegas for the happy idea, desiring that the Ex. Sr. Counselor, Director of the Faculty of Medicine, may set before the government the necessity of creating this chair, which may produce noble results.

"*To the Illust. and Ex. Sirs, Counselor Director of the Faculty of Medicine of this City, and the other Members of the same:*—

"The undersigned comes respectfully to present the following considerations to the attention of the faculty for their deliberation, hoping that his observations in favor of the public good—which is much interested in this matter—may be perfectly appreciated, and receive their cordial approbation.

"A glance at the lamentable state of the dental profession in Brazil, where the resources for a complete instruction are not within reach of those who might desire to study it as a profession, places the greater part of the practice of dentistry in the hands of impostors, who, without education, whether primary or professional, leave some unlucrative craft to embrace the lucrative, and, as yet, but little explored profession of the dentist, and who, in place of elevating the profession to the position it occupies in the United States and other progressive countries, degrade and abase it, to the detriment of humanity.

"These considerations have led me to think that a well-directed dental branch in the Medical School of Bahia would combat this evil in great measure. Bahia occupies the central and most advantageous place in Brazil, and with the establishment of this department, well-educated and respectable young men of this and other provinces would come here to study the dental profession, and in a few years dental practice would be in the hands of men of intelligence, and the public in general would derive an incalculable benefit from this.

"In order that this prove successful, it is needful that it be established and directed on the plan of the colleges of dental surgery in the United States, where the courses are chiefly practical, thus fitting the students to assume the responsibility of public practice immediately on concluding their apprenticeship.

"To this end a hall should be set apart for a laboratory, with all the needful elements, where the students may instruct themselves in all the various manipulations of the mechanical part of the profession, from the manufacture of porcelain teeth and the preparation of all the materials

used in the mechanico-dental art up to the completion and collocation of a set of teeth in the mouth.

"A hall for clinics is also needful, with a sufficient number of chairs for the students to practice therein all the operations required in the mouth, each student furnishing his own instruments, excepting those of extraction, which should be supplied by the college.

"The poor should be publicly invited, through the journals, to come gratuitously to the clinic for any dental operation, and for the collocation of artificial teeth, the cost of the materials being defrayed either by the college or by the students, as the faculty may determine.

"If the faculty shall judge this, my idea, suitable for such instruction, it may accept of me to explain to the students the different parts of dental instruction, or may invite some one more fitted to place at the head of so useful an instruction, and, on the fitting occasion, I will offer to the faculty a regulation I have at hand, such as is practiced in other countries.

"In submitting these, my ideas, I have no other end in view than to ennoble and elevate the dental profession, and at the same time to benefit the public.

(Signed) DR. J. F. VEGAS.

"BAHIA, March 21, 1863."

Nitrous oxide being the subject for consideration, was then introduced by Dr. Tees, who exhibited the apparatus he employs, and, describing it, said: This apparatus consists of a retort, a purifier, and a five and a ten-gallon bag. The purifier is a modification of Wolf's bottle, made of tin or galvanized iron, of one-half gallon capacity. The bags are somewhat different from the ordinary India-rubber ones, having muslin or silk linings for the gas to come in contact, thus rendering it pure, and preventing that disagreeable taste so repugnant to many individuals.

As it can be managed by a child after a little instruction, and can be furnished complete for the sum of fifteen dollars, its simplicity and comparative cheapness will recommend it for general use.

Heretofore nitrous oxide gas has been manufactured for practical purposes in a wine barrel, or copper or tin gasometer, holding about forty gallons. Since water absorbs a large amount of the gas, this is not an economical way of making it, and since it is necessary first to fill the barrel with forty gallons of water, it is not at all convenient, unless running water and a sink or bath-tub is at hand.

The gas can be kept in the apparatus for a week or more, but since it can be generated so quickly, I can see no especial advantage in this. By having a quart or half-gallon retort, and keeping it always half filled with nitrate of ammonia, so as to present a broad surface for the gas to escape, and keeping the apparatus on a table in the office, (a small-sized table being sufficient,) it can be generated as fast as it is used. The ten-gallon

bag can be filled in the morning, and kept filled during the day, in that way being always prepared. If more than that is required for an operation, the small bag can be filled from the large one, and the latter attached to the purifier to be filled up, which can be done by the time the bleeding from the first operation stops. By this means as much gas may be obtained as will be needed, with but little if any extra trouble. As far as my experience goes, both personal and with my patients, it is as good when first manufactured as it is when allowed to stand for any length of time. The gas can be kept for twenty-four hours in one of these bags without being affected by the possible action of *endosmose* and *exosmose*. I think, however, it is more economical to generate it as it is needed.

Prof. Morton said the "rationale" of this arrangement of apparatus is as follows: The gas escaping from the flask is caused to bubble through the water in the second part of the apparatus, in order, first, that it may be cooled and so deposit the steam by which it is accompanied; second, that any free nitric acid which may by chance be present in the salt (nitrate of ammonia) may be absorbed; and third, that any nitric oxide which may by chance be developed by too high a heat, may likewise be removed (by absorption in the water) from the gas.

The vessel in which these actions are carried on is made small, and the amount of water in it is limited, because a small portion is sufficient thoroughly to effect all these objects; while a large quantity would occasion serious loss by absorbing the nitrous oxide produced, of which water will take up three-fourths of its volume. Lastly, the gas is collected and stored in an India-rubber bag in preference to the ordinary pneumatic cistern or gas-holder, to avoid this same wasteful result of contact with large quantities of water, which can, it is true, be dispensed with in certain forms of the last-mentioned apparatus; but only by a large outlay in the first cost of construction.

The meeting was mainly devoted to the demonstrations of persons under the influence of nitrous oxide. Several present at the meeting inhaled the gas, with quite satisfactory results, so far as the control of an operator over his patients was concerned.

Adjourned.

PENNSYLVANIA ASSOCIATION OF DENTAL SURGEONS.

REPORTED FOR THE DENTAL COSMOS BY JAMES TRUMAN, D.D.S.

A MONTHLY meeting of the Association was held on Tuesday evening, December 9th.

The subject selected for the evening's discussion, "The Laboratory and its Fixtures," was opened by Dr. Barker, who remarked that, having proposed the subject, it devolved upon him to lead in the discussion. His object was the instruction of the members in all that pertained to the profession; but did not feel that he had much to impart.

Many of the profession appear to consider the laboratory of minor importance, and select very inconvenient situations for it. In his judgment, the proper place was as near the office as possible, where more care would be taken to keep it in order. Many of the operations performed in the laboratory are of a delicate character, and require a good light to save the eyesight. The floors should be very perfectly laid, all cracks being filled up, so that the sweepings may be readily collected without loss. The fixtures of the laboratory may be many or few. Very few consider it necessary now to have a gold furnace, as the majority of the teeth inserted are upon rubber base. His object being rather to receive than impart information upon this topic, he therefore called upon Dr. Wildman, whose laboratory fixtures were exceedingly complete.

Dr. Wildman said the fixtures were so many in the laboratory that he found it difficult to know where to begin or end. In his judgment, a good melting furnace was very important. Preferred the air or draught to the blast furnace, as it answers every purpose and dispensed with the bellows. He has one which he erected after his own plan, and found it very convenient. His is built of brick: is about twenty inches square, and the same in height. On the top of the brick-work rests a cast-iron plate, with flanges extending down about an inch, which acts as a clamp to bind the brick-work together. In this plate is an iron door, which opens into the body of the furnace. The grate is suspended at the back part upon a hinge, and in front by a bolt which projects through the front of the furnace. When the melting is finished, the draught door at the base in front is closed, the bolt withdrawn, the front of the grate drops, and allows the fire to fall down into the ash-pit, leaving the body of the furnace clear, and dies out in ordinary meltings before the brick-work becomes heated, which is an advantage in hot weather. The floor of the ash-pit is an iron plate to catch the gold, if by accident the crucible should be broken. The body of the furnace or fire-chamber is a seven-inch stove cylinder fire-clay, and eight inches deep, from the top of which, leading into the chimney, is a flue five inches wide by two deep. The body of the furnace may be built square; in this case, it should be faced with fire-brick. He generally used charcoal in melting; but where the heat was desired to be maintained for a long time, preferred anthracite. Though this is a small furnace, the doctor said he had melted without difficulty ten ounces of pure silver at a time. When the draught was good, had run down gold in fifteen minutes from the time of lighting the fire. He uses but one furnace for the precious and base metals; never had any difficulty in so doing. Examines the furnace before melting, and removes the base metal should it be present. Melts the precious first, and afterward the base metals.

The doctor exhibited a contrivance he had recently made, which, though not new to artisans, he thought might be to the profession. It consists of

a pulley, the support of which slides upon a bar, and is held in position by a set screw. This fixture is placed on the bench of the lathe or grinding apparatus, back of the fixed pulley, with the bar which holds the movable pulley at a right angle to the mandrel. In attaching the band to a lathe so arranged, the band from the front of the driving-wheel passes upward, back, and over the movable pulley, then forward, under, and over the fixed pulley on the mandrel, then downward to the back of the driving-wheel, thus making its circuit. The advantage of this arrangement is, the band touches more than twice the surface of the pulley that it does in the ordinary gearing, consequently has that ratio of traction. It is out of the way in front of the lathe, and may be tightened or loosened in a moment without stopping the lathe, simply by loosening the set screw, then sliding the movable pulley backward or forward, and fixing in position by the set screw.

He also exhibited a die-stock, with movable dies for cutting screws. The principle is similar to the die-stock used by machinists; but on a miniature scale, suitable for the use of the profession, and infinitely superior in its mode of action to the ordinary screw-plate. Dies of different threads could be readily inserted in this die-stock, from one that would cut a screw in a cambric needle, up to the largest screw used by the profession. In cutting a female screw, the top of the tap is seized between the point of the screw which regulates the distance of the dies, then the die-stock is used as a wrench.

In answer to a question of Dr. Buckingham, requesting to know how he would cut a tapering tap, the doctor said he would first cut a thread on the steel, in the same manner as in making an ordinary screw, then square or groove it, tapering to the point, so that merely a vestige of a thread should be left on the angles at the point, then temper.

The doctor exhibited a specimen of very fine moulding sand, presented to him by Mr. A. S. Reber. It was procured near Bellefonte, in this State. He found upon analysis that it was not ordinary moulding sand, which consists of 93 to 96 per cent. of silica, and the balance of alumina, with a trace of iron; but this contained in 100 parts, 92 of carbonate of lime, and 8 of silica and alumina. He stated that it took a fine, clear impression, and parted well. He considered it greatly superior to ordinary moulding sand. He exhibited some zinc medals cast in this sand, which were almost as perfect as the original. Dr. Wingate first called his attention to it last summer; but he had only recently had an opportunity of testing it. The addition of a small quantity of finely pulverized asbestos gives it additional toughness.

Dr. Buckingham said he had spent a good deal of time in the laboratory, and thought our first duty was to make the work performed a pleasure, which could not be done by placing the laboratory in such a situation as to render it repulsive. Years ago it was thought necessary

to have nearly all the appliances of the laboratory in the office. Of late, a great effort has been made to keep the operative and mechanical branches of our profession separate; but whether they were separate or united, all dentists needed a laboratory to shape instruments, alter irregularity plates, and for chemical experiments. The room selected should be convenient to the office. It was next to impossible to perform the nice operations required in the laboratory in some out-of-the-way place, such as the garret or cellar.

He had seen many changes in the tools and fixtures of the laboratory since he had been in the profession. His preceptor ground his teeth on a grindstone two feet in diameter; and another dentist with whom he was associated, used common grindstones about four inches in diameter; these were an improvement on the first. Emory stones were then introduced, and afterward corundum. To grind up a set of teeth on a common grindstone, turned by hand, was no small operation; and even on an emory stone, when the teeth were as hard as they were formerly made, it took a dentist longer to grind up a set than many would like to work at them now.

He considered Dr. Wildman's furnace the most complete in use. He had not used it; but had continued the use of the ordinary gas-furnace in summer, or a stove in winter, using anthracite coal for fuel. Occasionally a crucible would break, and then the metal had to be scraped out with the ashes, collected, and melted over.

He advised all to save the old crucibles after using them; they frequently have little cavities in them that could not be seen, which would become filled with the melted metal and remain there. He had recently broken up a lot, and had obtained between thirty and forty dollars worth of gold and silver from them.

The sweepings of the laboratory were also worth saving. He has known a barrel of them to bring from twenty to fifty dollars.

The doctor presented a cast-iron plate, with holes of different sizes in it, to be fastened up by the furnace to put crucibles in. He also exhibited a somewhat similar one to be screwed on a board to hold tools.

A plaster-knife was invented by a lad in his employ. He drilled a hole in the point of a butcher's knife and fastened it to an upright post, using the handle as a lever. It is very useful in trimming casts where the plaster had become very dry and hard. By soaking the casts in water they could be trimmed much easier.

He used for placing around his impressions to make a plaster cast, waxed linen, which was made by dipping the linen in melted wax. By warming it previous to placing it around the impression, it could be made to take almost any shape required. He had known dentists to use clay for this purpose. It was kept wet, and rolled out into long flat pieces, and placed around the impression when they desired to make a cast.

Dr. Kingsbury introduced to the notice of the Association a blow-pipe of peculiar construction, procured some years since from an English glass-blower.*

Dr. Buckingham said, the simplest kind of blow-pipe he knew of was made of an ordinary barrel with a blow-pipe attached to the top, when a stream of water was allowed to run into the barrel, and the air forced out through the pipe. When the barrel become filled with water a waste-pipe was opened and the water run out, when it was again ready for use. But he had never found any quite as efficient as the mouth blow-pipe. It was more under the control of the operator than any mechanical contrivance he had ever seen, and by heating the cases up to a red heat in the furnace it required but little blowing to solder them.

Dr. Bailey had found the great difficulty in using stationary blow-pipes was the stopping of the blast of air at the proper moment. The mind is apt to be diverted by the use of the treadle. In using the furnace to heat up cases, injury was often done by allowing them to get too hot. After trying many plans, he had returned to the old one of fitting the case on a piece of charcoal and using as little sand and plaster investment as possible, heating his case to a moderate degree on a stove, and then finishing by the mouth blow-pipe, keeping the case just hot enough for the solder to flow freely, which he controlled with a director or probe. He wanted both hands free, and used a light pipe, which he held in his mouth.

The doctor presented a bench-drawer for catching scraps and filings. It consisted of a simple square frame, the inside portion composed of sheet-tin, with four sides, converging and deepening to a circular centre-piece, which is pierced with numerous small holes, to allow the passage of filings into a cup fastened beneath, thus keeping them separated from the scraps, and avoiding waste in handling when using pieces in staying teeth, etc.

Dr. Wildman had seen drawers of similar construction, lacking the cup to catch the filings; considered the cup an improvement. He did not like the use of the tin plate or of zinced iron, as particles of the tin or zinc were liable to be scaled off by the tools and contaminate the gold. Considered Russia iron preferable for this purpose.

Dr. Bailey had used the drawer for many years and had found none of the difficulties suggested by Dr. Wildman.

Dr. Fouché had a similar drawer that he had used for the past twenty years, and considered it very convenient.

Dr. Buckingham said, before melting gold filings he always poured over them nitric acid to dissolve out any of the baser metals that might be in them, and silver filings he dissolved in nitric acid to make pure

* Dr. Kingsbury has promised an article descriptive of this blow-pipe.—Pub.

silver, from which he made solder and alloys for gold. He usually obtained enough gold from his silver filings to pay him for the trouble. The gold would get in from the files and in other ways.

Dr. W. W. Townsend wished to call the attention of the Association to a small watchmaker's drill, with a screw shaft, that he thought would be found very superior to the ordinary bow-string drill for all the purposes for which the latter is required.

Dr. Bailey had observed that plaster was very often tracked from the laboratory through the house. To remedy this, procure an ordinary barrel, and manufacture a simple tray with an opening in the centre, and cover the barrel; the dirt can then be readily scraped into it. It was simple, and would save labor in cleaning up.

Dr. Barker desired to call the attention of the Association to a plan of riveting teeth to backings. It was recommended to him by Dr. Wingate. Instead of placing the tooth on metal and riveting with the hammer, take an ordinary plate-punch, first placing a piece of cloth between the tooth and the instrument, and then press the pin down to the back stay. He considered this mode very efficient.

Dr. Bailey thought that in using the plate-punch, the less the instrument fit the tooth the better; then the antagonizing forces would necessarily be directly opposite each other, and thus applying the force only upon the point needed, there was less danger of fracturing the tooth.

On motion of Dr. Barker, "Hard Rubber, its Properties and Adaptability to the Mouth," was selected for discussion at the next monthly meeting.

Adjourned.

MERRIMACK VALLEY DENTAL ASSOCIATION.

A CONVENTION of the dentists in the towns and cities in the Merrimack Valley was held at the Citizens' Committee Room, Huntington Hall, Lowell, Mass., on Thursday, October 29th.

Dr. A. Lawrence, of Lowell, Mass., was elected temporary chairman, and Dr. W. G. Ward, temporary secretary.

The following resolution, offered by Dr. Gerry, of Lowell, Mass., was unanimously adopted:—

Resolved, That we form ourselves into an association under the name and style of the *Merrimack Valley Dental Association.*

On motion, a committee of three, consisting of Drs. Boutelle, of Manchester, N. H., Gerry, of Lowell, Mass., and Stevens, of Haverhill, Mass., was appointed to draft a constitution.

The committee reported a constitution which was adopted.

The following gentlemen were elected officers of the permanent organization:—

President.—Dr. A. Lawrence, of Lowell, Mass.

Vice-Presidents.—Drs. D. K. Boutelle, of Manchester, N. H.; S. H. Elliott, of Haverhill, Mass.; E. G. Cummings, of Concord, N. H.

Recording Secretary.—Dr. G. A. Gerry, of Lowell, Mass.

Corresponding Secretary.—Dr. L. F. Locke, of Nashua, N. H.

Treasurer.—Dr. S. Lawrence, of Lowell, Mass.

Executive Committee.—Drs. E. F. Rogers and C. Heath, of Manchester, N. H.; F. H. Stevens, of Haverhill, Mass.; S. L. Ward, of Lowell, Mass.; J. H. Kidder, of Lawrence, Mass.

The president, on taking the chair, addressed the convention as follows:—

Gentlemen of the Merrimack Valley Dental Association:

In accepting the flattering position which your partiality has assigned me, I should do injustice to my better feelings did I not give utterance, very briefly, to a few thoughts which the occasion seems to suggest.

The first is to tender you my sincere thanks for the honor conferred, with the assurance that I shall endeavor to merit your approbation in the discharge of my official duties; relying, however, largely upon your forbearance and support. Gentlemen, we meet here to-day as members of a common profession, one dignified by its literary associations and illuminated by the genius of many minds, both of the living and of the dead; a profession, honorable in its claims, useful in its practice, and as such endeared to each one of us.

We are quite apt to judge of the merits of men, of things, and of acts, by their usefulness. Dentistry, therefore, in its present advanced condition, whether it may be traced to a remote origin, or whether it be but the product of a day, so long as the admitted fact that it is useful exists, is entitled to our fostering care and support. A profession which a man does not respect, does not desire to see respected, and does not labor assiduously to advance, should at once be abandoned for something more in accordance with his tastes or his qualifications. It is the love of one's profession, coupled with his qualifications therefor, that makes him successful. It was the love of profession, united with unremitting diligence and study, which made Harris, Townsend, and others among the dead what they were, and many I might name among the living what they are. To a certain extent man is the creature of circumstances, but if circumstances, and not inclination, have made the dentist, then has the one party committed a gross mistake which the other should lose no time in rectifying.

But I am proud in the belief that most of our profession, at the present day, scorning such an origin, have risen above that tyrant, and now hold an honorable place in the public estimation both as skillful dentists and good citizens. In the infancy of our profession, the operator who could produce results which at this time would be considered as barely passable, such has been the stride of improvement, was regarded as a man of more

than ordinary genius. So too in the medical profession, Hippocrates, Galen, and others of their time, shone not so much because they were really stars of the first magnitude, as because of the darkness by which they were surrounded. Then the physician with his well-culled simples went from door to door soliciting patronage, and working marvelous cures by anointing the axe that made the wound, or by causing the patient to swallow written cabalistic signs. Dentistry too has had its dark age, *its* trunk-in-hand itinerant, whose unskillful manipulations will be long remembered by a too confiding and outraged public. But a brighter day has dawned, and dentistry now stands the peer of any profession; while a better informed and more discerning public stands prepared, in some degree at least, to discriminate between the well qualified, conscientious, and skillful dentist, and the ignorant, advertising, brazen-faced charlatan, whose race, unfortunately, has not yet become extinct.

Sanctioned by legislative enactment, several dental colleges now adorn the land, while in Europe the rapid advancement of the science is equally apparent and gratifying. Dental associations too, under various local names, have come into existence in considerable numbers, both at home and abroad, and the fact that new ones continue to be formed, while none, to my knowledge, with a single exception, have been dissolved, is pretty conclusive evidence of their beneficial tendencies. The single exception referred to was the "American Society of Dental Surgeons," which from some defective organism and bad nursing, after a lingering illness, died a few years ago in the house of its friends. Let us hope that no such fate is in reserve for us.

I have said that dentistry is entitled to our fostering care and support. But how shall we care for and support the profession of our choice?

Most certainly by encouraging correct and enlightened practice; maintaining an unblemished character and urbanity of manners. By an interchange of the courtesies due to each other, and the free communication of scientific facts of general importance. By refraining from and discouraging unprofessional practices of all kinds, among which detraction and calumny should be particularly guarded against as vices militating adversely to that high tone of character and manly respect, both for one's self as well as for others, which every dentist who lays any claim to good breeding, ought to enjoy and inculcate.

Again, by endeavoring to further enlighten our minds in accumulating knowledge relating to the science which we profess, and, in a word, by adopting the golden rule in our intercourse with each other and with our patients, shall we best exemplify our care not only for our profession, but also for ourselves and those we serve.

Gentlemen, allow me to congratulate you on the successful accomplishment of the object for which you have assembled, and on the happy auguries manifested for the future.

Let us take high professional ground, and with "*Labor omnia vincet*" for our motto, never fear that our efforts will be crowned with abundant success.

On invitation of the profession in Lowell, the members of the convention were requested to repair to the Washington House for dinner, which invitation was accepted.

On motion, a committee of three, consisting of Drs. Cummings, of Concord, and Boutelle and Carleton, of Manchester, N. H., was appointed to report a list of subjects for discussion at the next meeting. The committee reported the following subjects: "Professional Etiquette," "Filling Teeth," "Vulcanite Work," "Nitrous Oxide," "Dental Fees," and "Mechanical Dentistry," which report was adopted.

Adjourned to meet at Lowell, Mass., on the first Thursday in May, 1864.

BROOKLYN DENTAL ASSOCIATION.

BY THOS. BURGH, D.D.S.

A MEETING of this Association was held November 27th, 1863, when the following subject was discussed:—

"What Improvements in the Practice of Dentistry have fallen under our observation during the last few years?"

Dr. Hurd.—Improvements are differently regarded in different localities. Some regard the use of the mallet as an improvement, others do not. Finds a difference of opinion even as to the utility of filling nerve cavities. He regards both as improvements. Among other recent improvements are double-headed pins in teeth. But the greatest improvement is observable in the New York and Brooklyn Societies, to which is attributable the good feeling existing among us as dentists.

Dr. Atkinson.—Honest men think well of themselves. There is a class of dentists who are proud externally and vain internally; but the better class carry their vanity outwardly and their pride inwardly. To deny that we have both vanity and pride is sheer nonsense. All who take the pains to prove it, say as Dr. Hurd said regarding the use of the mallet. His pride of former opinion respecting it had been crucified. The only test of this, as of all things else, is to "try it" faithfully. Men should do what they do cleanly; in a word, by conscience versus the dollar.

Dr. Fitch.—Excelsior should be the motto of every honest dentist in reference to his every operation. Until a man is willing to take the place of a learner, and let the darkness out of him, there is not much to hope for him, either of good to the profession or personal advancement. Many things claimed as improvements in this age are urged upon our attention, and it behooves us to examine them carefully, and if found worthless to

discard them. Had thought much, and greatly desired that, by some means, the extraction of the pulp from a tooth, immediately and entire, might be effected without pain. A cement was very much needed to repair broken gums in artificial work which would withstand the disintegrating influence of the oral secretions. One prominent feature of the dental societies of the present day is a mutual regard for each other's reputation and a general good feeling. Whenever a member of these societies, especially the Brooklyn, has a valuable idea, he is willing to impart it. Remarked upon the treatment of alveolar abscess adopted in his practice as early as 1853, since which has regarded these conditions of the teeth as eminently amenable to treatment, and success as certain as the preservation of a tooth by filling. Conditions of the system must ever affect this dental disease; and it is highly necessary to promote healthy molecular change, and to eliminate poisons from the organism. Referred to Wood's Stopping as a valuable cheap filling material; but it required as much care during every step of the operation as when employing gold; otherwise, it would be found worthless. Censured the practice of dentists rushing to the protection of a patent with every new idea which they might either originate or appropriate and call it an improvement.

Dr. J. Allen.—Dr. Fitch does not, like some men, take advantage of another by making his thrusts in the dark; but confronts his man face to face. This is right; for it gives the one who thinks himself referred to an opportunity to reply. Said he was a patentee, and had on various occasions been severely censured for it, and felt a little sensitive upon that point. Thinks we should discriminate between valuable improvements and worthless notions. Had two objects in view in procuring a patent: one was to have it placed upon our national records, that he might not be robbed of even the credit to which he was entitled; and the other, that he might be reimbursed for the long and expensive series of experiments in perfecting his improved system. His course had led to expensive litigations which left him poor; and attempts to stigmatize him had been made for what he had done, yet he was determined to leave his mark in the profession.

Dr. Fitch disclaimed any reference to Dr. J. Allen. Does not object to dentists availing themselves of the protection of patents where they have really brought out a valuable thing, and where proper remuneration seems attainable only through a patent. But objects to every dental aspirant issuing letters-patent upon what has cost him but a few hours thought. Regarded few things in dentistry really worthy of a patent. Was rather an advocate of free trade in dental matters.

Dr. A. C. Hawes thinks Dr. J. Allen mistaken in regard to any stigma attaching to him. Thinks no one in the profession more respected than he is.

Dr. Atkinson yields to no man in admiration for Dr. J. Allen. Regards him as the embodiment, par excellence, of mechanical dentistry. Has known many in trouble in this branch go to him and find relief. If some kind angel had said to Allen and Hunter, "Work *together* for the good of the whole," much ill feeling and hard discipline for both might have been avoided. He who thinks the world dependent upon him is sadly mistaken. The world can do very well without us; but we cannot dispense with the rest of the world. The human body can spare a few of its molecules; but they cannot live without their connection with it. Objects to patents, because they stimulate men to get unclean money. The best patent is a good conscience. Stands condemned in the minds of some as an extortioner; but does not see it himself.

Dr. Robbins, of Meadville, Pa., was called on. Feels that he is improving every year from reading and other experiences. Knows that bone has been reproduced under certain circumstances; and would ask if loose teeth, from waste of their sockets, have been known to be made firm again?

Dr. Atkinson replied in the affirmative, and gave two forms in which he uses iodine with success, viz., a saturated solution of resublimed iodine in creosote, and the officinal tincture of iodine. The first he inserts by slips of bamboo, or other tough wood, down the suppurating sockets, until the pus-producing character is changed to a plasm-producing condition. After that, he paints the newly-produced parts with tincture of iodine till well.

Dr. Fitch had taken some positions, and asked questions at the last session of the American Dental Association in relation to the restoration of the alveolar processes. In scrofula and scorbutic tendencies, these processes are very apt to disappear gradually when there is no manifest local disease. This was also the case in syphilitic taint. It was his opinion that these processes could be reproduced, provided the exudate could be retained about the root of the tooth, and protected from the oral secretions during its change into bone. But whether its attachment can really be secured to the root after denudation has taken place is quite questionable. Instanced a case in which the inferior incisor teeth were very loose. Patient past fifty. Employed a saturated preparation of iodine in creosote, tincture of iodine, wine of opium, etc. After arresting the diseased action, endeavored to establish just enough irritation to produce healthy exudate. Was quite successful in this instance in tightening the teeth. There was danger at the different stages of the renewal process of over-medication.

Dr. Hurd, since acquainted with Dr. Atkinson, has become almost a fanatic in the use of creosote. Mentioned the case of a young lady whose gums looked to be in good condition, but the teeth were loose. Bled the gums around every tooth. At the end of a week no improvement.

Then tried creosote. In another week there was a great improvement. Teeth finally firm.

Dr. Robbins specially directed attention to the reproduction of the processes when so destroyed that but portions remained. Had much trouble with drinking men in this disease. Mentioned a case of a patient of this class, in which the discharge alternated periodically from one side of the mouth to the other.

Dr. Atkinson.—We are often too anxious to get through with the case, and tell the patient he is well, or will get well without further treatment. His experience has taught him to get control of the patient, or not undertake the case. Reproductions of the bones have engaged much of his attention. Those especially of the face are liable to resolution of the new deposit, unless the system is kept in proper condition by correct regimen and remedies. The rule is, to watch the effect of the iodine in inducing new granulations of the soft parts, and their proper hardening or organization, until there is no perceptible difference between the new and old tissues; at which point alone, we are justified in discontinuing our dressings and dismissing the case as *cured.*

Dr. Fitch regarded a sprightly, frothy condition of the oral secretions, as if permeated with carbonic acid gas, as the most healthy. Constitutional lesions could generally be detected by the character of the oral secretions. In many diseased conditions where constitutional treatment was required, regarded muriated tincture of iron quite important; as the iron becomes the carrier in the blood of oxygen, which decarbonizes the tissues and stimulates the peripheral and central nerves to healthy action. But would also employ the different phosphates. Spoke of the effects of creosote upon a tooth suspended in it, which was shown him by Prof. J. Foster Flagg. The tooth was rendered nearly transparent, and its structure did not seem to be softened in any degree. Cautioned against the too free use of creosote introduced by cotton into the root of the tooth at the time of filling. Thought that the taste of creosote for some days after a tooth had been thus treated might be owing to the passage of creosote through the root and out of the free margin of the gum.

Subject continued. Society adjourned.

DELAWARE DENTAL ASSOCIATION.

REPORTED FOR THE DENTAL COSMOS BY S. S. NONES, D.D.S.

The monthly meeting of this Association was held in Wilmington, at the office of Dr. Marshall, on Tuesday evening, December the 8th, at eight o'clock. President in the Chair.

The minutes of the last meeting were read and adopted.

Dr. Nones then presented to the Association four numbers of the *People's Dental Journal*, received from Dr. Allport, of Chicago.

Dr. McQuillen, the essayist for the evening, gave a very interesting description of the HUMAN TEETH IN THEIR RELATION TO MASTICATION, SPEECH, AND APPEARANCE.*

An instructive and practical discussion ensued, in which the members present gave their views in relation to the subject.

At the close of the meeting, a vote of thanks was tendered to Dr. McQuillen for the deep interest manifested in the Association.

On motion, adjourned.

REVIEW OF DENTAL LITERATURE AND ART.

BY J. H. M'QUILLEN, D.D.S.,

PROFESSOR OF ANATOMY, PHYSIOLOGY, AND HYGIENE IN THE PHILADELPHIA DENTAL COLLEGE.

ANTAGONISTIC FORCES.—In the broad economy of nature, forces, the antipodes of each other, and which, if they had uninterrupted play, would result destructively to the matter they influence and operate upon, by a wise provision of Providence are made all-powerful instruments in establishing and maintaining the harmony of the universe. Thus, in the planetary system, the *centrifugal force* by which a revolving body tends to *fly from the centre of motion* in the direction of the tangent to the path the body describes, is opposed by the *centrifugal force* through which a body revolving about the centre is *drawn toward that centre;* thus each, while opposing the other, is at the same time *controlling* and *controlled* by the other.

Again, *cohesion*, the *attraction or force* by which particles of homogeneous bodies are kept attached to each other, is opposed by *repulsion*, a force universally inherent in, and an essential property of matter, acting at minute distances, by which all bodies, and their constituent particles, are kept from *absolute contact.*

In many other directions, the harmonious results arising from the operation of antagonistic forces on inorganic matter might be referred to and dwelt upon; but permitting this to suffice, and passing to animated nature, and taking man as the highest order of the organic world, it is found that the various movements of the body are effected through the agency of what are denominated antagonistic muscles. Every glance of the eye, every change in the varying expressions of the face, is effected by and dependent upon the action of muscles drawing in opposite directions;

* The publication of this communication is delayed on account of the limited time afforded the engraver to prepare the illustrations.

and every step that is taken is accomplished by the combined action of *flexors and extensors.* In the act of *prehension*, the hand reaches forward to the food by the contraction of *extensor muscles;* and then by the action of the antagonistic *flexors*, this is seized and carried to the mouth, where it is subjected in *mastication* to the combined action of antagonistic teeth, and the *depressor and elevator muscles* of the lower jaw. In *deglutition, chymifaction, chylifaction, and defecation*, the vermicular or peristaltic motion of the œsophagus, stomach, and intestines is due to the alternate *relaxation* and *contraction* of the non-striated, *longitudinal*, and *circular* muscles engaged in propelling the nutrient mass from above downward. In the *circulation of the blood*, the diastole and systole of the heart constituting its rhythmical motion, is the chief impelling power by which that fluid is kept in motion. In *respiration*, the constant and necessary change from venous to arterial blood is effected by the *exhalation* of carbonic acid gas, and the *inhalation* of oxygen. And lastly, in *nutrition*, it is a well-attested fact that from the earliest period of fœtal existence until the cessation of life, two operations are constantly taking place in the elementary structure of the various tissues and organs, viz.: first, *composition*, or the process by which the nutritive material becomes assimilated; second, *decomposition*, or that action by which old parts are removed.

These two actions, occurring in every part of the economy, are modified, however, by the age, constitution, state of health, and relative density of the different tissues, being most active in youth, greatly lessened in old age, occurring with greater rapidity in vascular than non-vascular tissues, and after the various organs have attained a definite size, so long as *composition* and *decomposition* are harmonious—the *repair* being equal to the *waste*—the parts undergo no appreciable change of size or form; but if one or the other preponderates, *hypertrophy* (due to excess of nutrition) or *atrophy* (owing to deficient nutrition) is the result.

As a general rule, the greater the demand for the functional activity of an organ or tissue, the more energetic its nutrition. This is markedly manifest in the muscular and nervous tissues. The enervating effects of *inactivity* upon the physical structure and energies of mankind, few can have failed to notice. Rust is more fatal to metal than wear; and thus is it with the intellect of man, which, missing the appropriate stimulus or exercise, fails to be fully developed, or having been developed, and losing the accustomed stimulus, becomes weakened and relaxed.

There is nothing better calculated to develop the latent powers of the intellect than to occupy a scene of constant *action*, involving of necessity difficulties, oppositions, and antagonisms which must be overcome by unremitting exertion. And one should be thankful for the occasion which stirs him out of lethargy—puts him, in a manner, upon a

course of training—requiring the exercise of *forces* or *powers* of which he had before been scarcely aware, and giving him the exhilarating consciousness that he is proving himself a man.

In the language of Burke, "DIFFICULTY is a severe instructor set over us by the supreme ordinance of a parental Guardian and Legislator, who knows us better than we know ourselves, as he loves us better too. He that wrestles with us, strengthens our nerves and sharpens our skill; our antagonist is our helper. This amicable contest with difficulty, obliges us to an intimate acquaintance with our object, and compels us to consider it in all its relations; it will not suffer us to be superficial."

It may be truly said of *life* (which it is evident from the above depends upon the continued operation of apparent antagonisms) that not only its *usefulness*, but its *enjoyment* consists in *action;* and it is with man as with nature, which, according to a happy expression of Goethe, "knows no pause in progress and development, and attaches her curse on all *inaction.*"

That which is true of the individual man, holds with equal force in the relations of society and in the progressive development of the great interests of the world. Every new discovery in the arts and sciences; every advance in the amelioration of human suffering; every new avenue which is opened for the investigation and dissemination of knowledge, enters upon the struggle for existence at great odds, and opposed by those who, favoring long-established and well-recognized principles, facts, customs, etc., are ever found in opposition to the new and untried. Trying as such an ordeal may be to the weak and unstable, this but serves to bring out, in a more marked and decided manner, the resources, capabilities, and powers of that which has a sure and solid foundation.

The world may be said, indeed, to be made up of two great elements—the *Progressive* and the *Conservative:* the one reaching forward, seeking development in every direction; the other, content with the old, and clinging to it in the most tenacious manner, and it is the constant struggle between these two elements which keeps the world alive; and by their antagonism, they are mutually corrective of each other's extremes.

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DECAY IN THE GRINDING SURFACE OF MOLARS.—Valuable and indispensable as rose heads and flat drills are, there can be no question that their employment in the removal of decay from the grinding surface of molars is frequently deceptive, alike to patient and operator, each supposing that the decay is entirely removed when but a limited portion has been reached. Reference is here made to the fact that a cavity, which to an ordinary or careless observer appears to be of limited extent and confined to the centre of the grinding surface, will be found to

have radiating from it in four directions—anteriorly, posteriorly, and to the buccal and palatine sides of the tooth—four delicate black lines or cheeks in the enamel, frequently so slight as almost to escape attention. In cases like these, to drill the decay from the centre and neglect to examine carefully, as is too often done, the radiating lines, so as to ascertain whether they should not all be carefully followed up and excavated, is performing the operation in a reprehensible manner; for it matters not how thoroughly the decay may have been removed from the centre, or how solid the filling introduced may be, if these radiating lines are in fact narrow but deep fissures, sooner or later the failure of such operations will be fully demonstrated.

The proper course to adopt under such circumstances is to *test* these lines with *very fine* probes, and whenever there is the slightest manifestation of decay, to thoroughly excavate. The most useful and reliable instruments in effecting this are *chisels* of various sizes, some straight and others slightly curved. With these the decay can be removed in a prompt and effectual manner, leaving the cavity, as a general thing, in the shape of a cross.

A case was presented a few days back in illustration of the above. The right upper first molar had a small cavity in the centre of the grinding surface, with the faintest possible line extending from it toward the anterior approximal surface. After removing the decay from the cavity in the centre, the line was followed up, and although no indication was offered of the condition of affairs, it was found to open into a very extended decay, and involving a large portion of the anterior part of the tooth.

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The Philadelphia Photographer, a monthly journal, devoted to photography, January, 1864.

The first number of a magazine of sixteen pages, with the above title, has been received from the publisher, and presents a fair table of contents interesting alike to the photographist and the general reader. The first article is from Dr. R. Shelton Mackenzie, and gives a brief history of the origin, progress, and present position of the photographic art. The relative claims of Niepee, Daguerre, and Talbot, as discoverers, are presented in a graphic manner. It is the design of the publisher to present a specimen photograph in each number "that will be useful, acceptable, and valuable." The one accompanying this number, "The Loan of a Bite," is a superior photograph, by the well-known Gutekunst, of Philadelphia, of an engraving bearing that title.

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Dental Register of the West—August.

"Institutes of Dental Science. Read before the American Dental Association, by Wm. H. Atkinson, M.D.—He who assumes to teach this department of dental science entitles us to look to him for the solution, in

principle, of all the perplexities which are liable to arise in the whole range of operative and mechanical dentistry! In view, then, of the immense responsibility attached to this chair, who is there among us who may not well shrink from assuming the performance of the duties legitimately arising within its least extended domain?

"Notwithstanding the lively appreciation with which I regard the responsibilities of this department of instruction, without which all others are useless, I heartily rejoice that just such an onerous chair has been inaugurated in at least two dental schools.

"The sense of need for such a chair is sure to bring out or create the ability to fill it just so soon as the high necessity is generally felt and acknowledged in the profession. I say acknowledged, and by that I do not mean a tacit assent of the mind merely, but a hearty expression of that conviction on all occasions, coupled with earnest endeavor to add some mite to the general interest by inquiry, or a showing how and where to apply some principle which constitutes a focal point of demonstration indicative of its relation to, and control of, correct practices in the premises, which by multiplication and aggregation will soon become the beginning of a code of principles or institutes capable of improvement and enlargement in the ratio of the numbers thus actively engaged in preparing a reliable guide to coming inquirers for a plain path in which to walk.

"To be sure, 'theory' and 'principles,' usually coupled with 'practice,' in medical schools means the same thing, but does not express the real function of the chair in such manly, unequivocal terms!

"Although, as hinted, it smacks of impudence to accept such a chair, it also indicates a very different quality of mind, viz., a willingness to try to be of service in a direction that the nomination to the chair indicated ability was thought to lay, which of itself is earnest of the fact, as has been often proved, in the calling of men to posts they deemed themselves utterly unfit to fill, proving to be our very first teachers and leaders so soon as they had time to bring their latent powers into the work.

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"There is a quality and range of mind which, naturally ethical, as naturally thirsts to see principles dominate practice, as they should, as does the practical, barely fact mind demand that practice shall be the touchstone for all theory which at best is regarded as of but little account.

"He who feels that he has a mission to fulfill must needs be about it. And he will often be quite unconscious of any peculiar fitness for that special department other than the abiding desire that higher culture prevailed in that direction. Such a mind will teach irrespective of consequences, simply because he must. By continuance of which course, he must be more than ordinarily dull if he do not become transcendently fitted for the course sedulously followed under the spontaneity of an ardent nature."

New York Dental Journal—September.

"The Influence of Intermarriage between Nations upon the Teeth.—The importance of the subject concerning which we propose to write the present article, is only equaled by the absolute dearth of information that exists in reference to it. The physical results of interrelations between different nationalities have long enlisted the attention of

scientific men, both generally and specifically; but never in reference to the point upon which we propose to touch; and we have, therefore, a natural diffidence in approaching a subject when we may be considered as groping in the dark for the first principles.

"It will, doubtless, be readily admitted by all reflecting minds that, as a rule, the teeth of the American people are possessed of less vitality, more frequently decay, and are more generally of irregular and abnormal growth than those of any other civilized nation.

"This fact cannot reasonably be attributed to climatic influences, because the Indian tribes all over the continent are noted for the beautiful condition of their teeth, their health, and regularity, while they have for generations been subjected to the same influences.

"Neither can it be attributed, in any great degree, to our mode of living, because in that respect we do not differ widely from other civilized nations. The question then arises, What is this prolific cause from which occur such evil and dangerous results? We desire to bring the attention of the profession to this question, with the hope of eliminating such facts as their experience may have collected having reference to it.

"When we consider to what an enormous extent our population has always been made up by an aggregation of individuals from all parts of the world, intermingling so intimately by association, that blood relationships are constantly being formed with natives of every portion of the globe, we cannot but think that this condition of things must necessarily exercise a vital influence over both our physical and mental systems.

"That this influence cannot be over-estimated, is proven by the peculiar characteristics resulting from an intermarriage between the negro and the white, as seen in the mulatto, whose physical capacity is so greatly depraved when compared with that of either of his progenitors; and by the same results from the union of the native Indian and white, whose 'half-breed' offspring are without the physical qualifications of either.

"It is, of course, well known that the conformation of the jaw differs widely in different nations.

"The German jaw, for example, will average one-fourth wider than that of the American. Is it not reasonable to suppose that when this formation comes to be allied to one entirely different from it, the result must be what any departure from nature's laws will necessarily induce, viz., deformity, or abnormal structure?

"For example, from the combination of the large jaw with teeth proportioned to it, with the small jaw and small teeth, why might we not have in the next generation, perhaps, the small jaw of the one, crowded with the large teeth of the other, and *vice versâ?*

"We throw out these questions for information, and we desire to have them answered.

"We have considered this subject seriously, and what experience we have had, leads us to believe that these influences to which we have alluded are under-estimated in our consideration of the causes of decayed and irregular teeth.

"We trust we shall hear from the profession in reference to the hints we have thrown out, and our pages are open to anything touching them."

PERISCOPE OF MEDICAL AND GENERAL SCIENCE IN THEIR RELATIONS TO DENTISTRY.

BY GEO. J. ZIEGLER, M.D.

"*Freedom of Thought.*—The history of man is full of noble examples. Wherever we turn our eyes, whether it be to ancient Greece and Rome, to England, or to America, we behold men who, even in the face of long-cherished opinions, have dared to stand up and proclaim the truth. Such men deserve our highest admiration, for it is a truth, and a lamentable truth, that mankind are prone to stone to death their own prophets, while they raise up monuments to those of the past generation.

"Those who have given to the world the most sublime truths have, in their own day, received the greatest censure. Years roll on, and their descendants acknowledge them as benefactors, and award them that just, deserving praise which while they lived was denied them.

"The funeral of Socrates was hardly celebrated ere his fickle-minded countrymen repented their rashness, acknowledged his innocence, revoked his sentence, and put to death his accusers.

"Harvey, even by his most intimate friends, was regarded with distrust—he was altogether 'too speculative,' 'too theoretical;' and his enemies saw in the publication of his tract on the circulation of the blood nothing but indications of a presumptuous mind, which dared to call in question the revered authority of the ancients.

"Galileo was threatened with death if he did not declare his assertions in regard to the motion of the earth to be false.

"Robert Fulton, even in enlightened America, was branded as a lunatic. And Professor Morse was commiserated by his friends for being misled by the absurd idea of an electric telegraph.

"It has proven too true, in all ages and in all countries, that he who advances a great and new idea will meet with the opposition of thousands who judge without examination. And yet have not all these great men received this reward? Was that soul-inspiriting consciousness of having done their duty, of having given to the world the living truth, to them as nothing? Did they not feel their souls rise within them, and hear a gentle voice whisper words of approbation?

"To him who loves the truth because it is good, this high moral feeling is alone a sufficient recompense. Aye, yet he receives more: unborn ages will rise up and bless his name, they will cherish his remembrance; and could he speak from the tomb, he would say: 'I am fully rewarded.'

"These were men who dared to think for themselves; they believed in the divine right of independence of thought. Not content with the vast amount of knowledge which they could glean from the works of others, they studied the great volume of nature, and here they discovered the fallacy of long-reverenced ideas.

"The iron-shod steed which now thunders across our continent, and bears our produce from State to State, which shortens distance and promotes our happiness, once existed but in imagination's realm. The thunderbolt, now chained, bows to the wish of man, and speeds along the telegraphic wire to bear our thoughts. The mighty ocean, once a barrier never crossed, has now become the world's highway, and nations

having friendly intercourse with nations paves the way to common brotherhood.

"Such are the products of free, untrammeled thought, once considered as the effusions of a weak, unbalanced brain. How sinful, then, for us to decry that mortal man who dares express an opinion differing from our own! There are truths yet to be discovered, laws to be found out, which, were they pronounced to-day, would bring down upon the discoverer the contempt and ridicule of the world. Under fear of this, who can tell how many bright schemes have died within the breast, how many lofty intellects have smothered the glowing fires within them, and passed off the stage of life, to be forgotten!

"Sir John Herschel once said: 'The character of a true philosopher is to hope all things not impossible, and to believe all things not unreasonable.' One of the most daring, noble thoughts of man is summed up in the simple sentence: 'All are created free and equal;' and though this proclamation has caused the tyrant to start from his very seat and quake with fear, though whole nations armed themselves and cried, 'Down with the wretch who dares proclaim equality!' it was truth none the less. When the deep and earnest thinker beholds a man whose locks are white with age bow before a new-born babe and say, 'It is of "royal blood," designed by Deity to rule,' he turns away to mourn. Such use not their reason. The earnest thinker turns to nature; he marks the sun, the winds, and gentle dews; they favor not one above another. All nature seems to say *Equality*. The humble born can rise to fame, receive just and honest praise; while royal life, giving way to selfish pleasures, may go down to just oblivion. None rule by right divine save they whose riper judgment should command respect. Upon this truth rests the prosperity and happiness of our nation. S. C."—(*Am. Phrenological Journ.*)

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"*On the Molecular Theory of Organization.* By Dr. J. Hughes Bennett, Professor of the Institutes of Medicine in the University of Edinburgh. (Proceedings of the Royal Society of Edinburgh, April 1st, 1861.)—Parodying the celebrated expression of Harvey, viz., *Omne animal ex ovo*, it has been attempted to formularize the law of development by the expression *omnis cellula e cellula*, and to maintain 'that we must not transfer the seat of real action to any point beyond the cell.' In the attempts which have been made to support this exclusive doctrine, and to give all the tissues and all vital properties a cell origin, the great importance of the molecular element, in Dr. Bennett's opinion, has been strangely overlooked, and the object of the present paper is to show that real action, both physical and vital, may be seated in minute particles, or molecules much smaller than cells, and that we must obtain a knowledge of such action in these molecules if we desire to comprehend the laws of organization. To this end, the author directs attention: 1st, To a description of the nature and mode of origin of organic molecules; 2d, To a demonstration of the proposition that these molecules possess inherent powers or forces, and are present in all those tissues which manifest vital force; and 3d, To a law which governs the combination, arrangement, and behavior of these molecules during the development of organized tissue."—(*Ranking's Abstract.*)

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"*Physiology.*—The study of physiology teaches us that every part of a living being has its own independent vitality, so that a portion of a

body, as, for instance, a tooth or a testicle, may be entirely separated from its connections, and may become united again to another living being, and may there form permanent and intimate relations. Each part has its natural period of development, growth, persistence, and decay. Each is, in the natural process of nutrition, constantly being renewed. Some material is being taken away, and some fresh matter is being added; but during this process the part remains the same, and retains its individuality. We recognize the same hand or face that we knew twenty years ago, although it may have no particle of its former structure. Each part, formed on the matrix of that which preceded it, partakes of its nature, although it may be endued with very different degrees of vital power.

"Now, as in natural, so in political and social constitutions, the aggregate of the different living members constitutes the life of the whole. And a corporate body may remain the same, although its individual constituents are from time to time changed. We lived in our ancestors as they will survive in us."—(*Extract from Introductory Lecture in St. George's Hospital*, by MR. HENRY LEE, *Med. Times and Gaz.*)

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"*On the Formation of Mucus and Pus.* By THOMAS K. CHAMBERS, M.D., Hon. Physician to H.R.H. the Prince of Wales, Physician to St. Mary's and the Lock Hospitals, etc.—In the vitalized forms which they present, we may consider pus and mucus as identical; the pus-globule being merely the descendant more or less remote of the mucus-globule, and both retaining only that low degree of life which they originally derived from the body. The physical differences between the two depend seemingly upon the medium in which these vitalized forms are suspended. Neither in pus nor mucus are the contents of this medium constant in their proportion to one another; no two analyses of pus or mucus are ever the same.

"Indubitable pus and indubitable mucus may be clearly defined as the two ends of a scale, between which there are innumerable gradations. The most transparent, stringiest, and least globular mucus consists principally of a peculiar animal matter, which is not albumen, though it closely resembles it. It is not coagulable by heat, and it contains more oxygen on ultimate analysis than albumen does. Sulphur also appears not to be one of its constituents. Until it can be found reducible to be considered a compound of some known intermediate substances, it is temporarily called 'mucin.' This word simply means mucus divested of those contents which are capable of another nomenclature and physical separation, as, for instance, epithelium-scales, blood, the ammonia of decomposition, etc. The analyses are well known, being reprinted in every work of physiological chemistry, but shed little light, for the obvious reason that the substance analyzed is hardly ever twice the same.

"Pus, on the other hand, contains a large quantity of albumen, and a large quantity of fat. A modification in the mode of the loss of health is characterized by the presence of fibrin, and certain forms of defective vitality by casein being also found. The inorganic constituents of both seem to be the same as those of blood-serum with some of its water lost. Our diagnosis, then, of the morbid secretions of the mucous membranes should be not absolute—not that such and such a specimen *is* pus or *is* mucus—but comparative, that it is *more or less* purulent, according as it exhibits a greater or smaller quantity of albumen; a fact easily ascertained

by the degree of its coagulation by heat when diluted with water. And this is thoroughly practical and important, for it indicates the degree of loss of local vitality in the secreting membrane. Equally practical also and important is the observation of the presence of fibrin and its amount. In large and overwhelming quantities we are familiar with it as occurring in the most serious deficiency of life consistent with life at all which we find in mucous membranes; and there appears even in minor cases a close connection between its amount and the degree of deficient vitality or inflammation. During a severe cold in the head minute clots of spontaneously coagulating fibrin may be found in the secretion of the Schneiderian membrane, which, existing in large quantities, form the false membranes indicative of the serious poisoning of the system in diphtheria and croup.

"The phenomena we see on the mucous membranes are a question of degree rather than of essential difference.

"Loss of vitality, as shown in mucous membranes, seems to be exhibited in the following degrees:—

"First there is an *arrest of function*. For example, from the impression of cold the Schneiderian membrane is temporarily deprived of its endosmotic force; it ceases to absorb the water which is condensed on its surface from the breath, and that water drips from the nostrils. Or the stomach or intestines, from mental or physical causes, are deprived of their power of absorbing and digesting the fluid matters presented to them, and partially first excreted from them; and these fluids may pass away by diarrhœa. Or the skin is chilled, and shows its deficient vitality chiefly in the deficiency of its most prominent function; though it feels painfully, it cannot feel so delicately as it ought. In a vigorous person full life is soon regained; the nose recovers its natural degree of dryness; the intestines absorb again before the fluids have passed from the body, and the temporary indigestion does not arrive at diarrhœa; the skin recovers its feeling after a temporary painfulness. But we know that our invalid patients, whose vitality is low, are not so easily reinstated. Catarrh of various parts quickly and readily follows the action of physical agents. It is probable that in this least degree of injury the capillaries are contracted in area, and consequently the rapidity of their stream increased by the action of the nerves. This phenomenon is wanting if the injury is greater; in experiments upon animals the microscope does not detect it, if the reagent applied is powerful.

"2. A greater degree of injury is accompanied by a loss of elasticity in the capillaries. Their dilatation, and the consequent retention and stagnation of the blood in them, is familiar to us all, in both the living and dead subject, as '*inflammatory congestion.*'

"3. This stagnation may be in isolated spots complete; the blood-discs adhere together in rolls, as when removed from the body, and block up the passage. Thus the arterial wave is obstructed in its course, and like an ocean-swell, shattered against a shore of rocks, becomes more evident to the senses as the well-known '*throbbing.*' It is shortened and sharpened, but there is no evidence that it is strengthened; indeed, the analogy I have cited, and the general fact of weakness being accompanied by quickened pulse, would seem to show that it is diminished in propelling force.

"In the mean time there is an accumulation of that constituent of the blood which most resembles in appearance the element of young growing

tissue—the colorless blood-corpuscles. The blood is dark, indeed, to the naked eye, but under the microscope is seen to be made dark by being filled with these pale bodies, possessing a high refractive power.

"The loss of elasticity in the coats of the capillaries renders them more easily permeable by the contained fluid. Serum is poured out into the neighboring parenchyma, and joins with the swollen capillaries in producing '*swelling.*' The loss of vitality in the blood-discs may be so complete that their hæmatin is dissolved in the serum, and we get the surrounding parts stained with it—as for a short time in typhus fever, and for a long time in syphilitic eruptions. Or the blood-vessels may completely lose their cohesion and be ruptured, allowing of hæmorrhage. But in all this there is no new process, nothing which is not a direct deficiency of function.

"In solid structures this effusion is followed by an endosmotic current of the watery part back again into the circulation, leaving behind it the more solid and coagulable constituents. On free surfaces, covered only by soft open epithelium, the water and salts therein dissolved escape, forming the fluid of the mucus. The elements of new tissue, being there very copious to supply the constant demand for growth, ooze out copiously with the serum, and constitute the mucus globules. They are wasted elements of new growth, not themselves a new creation, or evidences of superadded life.

"How do these matters get through the coats of the capillaries? There cannot be holes for their escape, or the blood-discs, which are the smaller of the two, would always escape also. Doubtless this is one of the great riddles of physiology. But I think the art of drawing is in a certain degree responsible for some of the difficulty which it presents to our minds. When we have no means of correcting by our other senses impressions made on the eye, we are too apt to consider everything with an outline as equally solid. The necessarily hard outlines of the engraver express to us forms which may, for all we know, be spheres of cast-iron, whereas in truth they are as delicate as aerial clouds. Why may they not pass through tissues, mutually dissolving and dissolved by the materials of those tissues? Just as we see a stratum of fleecy cloud among mountains, or in Turner's pictures, disappear when it comes to a stratum of warm air, and reappear in the same form when it emerges on the other side. To get just ideas of nature, we must look upon solidity as a comparative, not as an absolute, quality.

"4. In a higher degree of deficient vitality the serum contains albumen and fat also exuded with it; and this mixed with the multiplied globules constitutes the fluid we call 'pus.' The albumen and fat not only escape on free surfaces, but saturate also the tissues they escape through, making them more retentive of water than would otherwise be the case. Inflamed cuticle takes a much longer period to dry than normal cuticle. Langhans found that a piece of healthy rabbit skin was dry in three hours, but a piece of the same skin which had been inflamed during life took twenty hours to part with its moisture to the same extent. Thus it appears to be saturated with the nutriment which it has lost the power of employing aright.

"5. Pus formed as I have described is a soft, greasy liniment, which tends probably to shield the parts with which it lies in contact from foreign influences, which in their condition of lowered vitality would be noxious to them. It is more bland and less liable to decomposition than

any artificial application. Kept on the healthy skin it causes less irritation than even water. But under certain circumstances it becomes what we term *ichorous*. In this state it is corrosive, poisonous, and destructive to the neighboring tissues. Now, this cannot arise simply by the chemical decomposition of the pus itself in consequence of retention, because in a good many cases (as in cancrum oris, for example) it has not been retained so long as usual, but is thrown off ichorous and irritating as it is formed. But you may observe that in all these instances of ichorous pus there is necrosis, mortification, ulceration, or some other form of actual loss of tissue. Tissue may be forming as in granulations, but it is being destroyed at the same time with abnormal rapidity. I cannot but think, therefore, that the ichorous nature of such pus may be due to its saturation with the organic acids which are the results of the decomposition, not of the pus itself, but of the melting tissues. Wash away this irritating pus, clean the sore, and that which is then formed often is quite bland and benignant. As pus differs from mucus, so ichor differs from pus in the nature of its accidental fluid constituents.

"The formation of ichorous pus exhibits a further stage of loss of vitality. The poisonous part of it seems to be peculiarly soluble, and capable of uniting with, and destroying, animal tissues. Absorbed into the blood, it naturally destroys the vitality of the constituents of that fluid, causes it to coagulate in localized spots, and thus to give rise to the congestions and abscesses of pyæmia. When we reflect how easily ulcerations may arise in mucous membranes, and what an active surface they offer for absorption, we cannot be surprised at the frequency with which pyæmic abscesses follow slight injuries, such as operations on the bladder, crushing of calculi, typhous inflammation of the bowels—cases which seem of minor moment, but which certainly involve solutions of continuity, with consequent decomposition of tissue and the formation of ichor, in a situation very open to absorption.

"6. The formation of fibrinous coats on mucous membranes I have already shown not necessarily to involve destruction of the epithelium. Is the loss of vitality which causes it to exosmose through the capillaries in the fibrin itself, or in the walls of those vessels? Whichever it may be, such an exudation certainly is evidence of a great deficiency of life; and, moreover, by the mechanical impediment it throws in the way of the functions, usually leads to further deficiency.

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"The influence of physical agents on mucous membranes which are throwing off mucus or pus, or are disposed to do so, is very different from what it is during their health. A degree of cold, which is borne with ease by them when in full vigor, causes a further arrest in their functions, and heat is equally badly borne.

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"The influence of heat upon mucus is a suggestive fact. If allowed to get cold, the globules cease to develop the little life they have; but if kept at the temperature of the body, they continue to grow into pus in spite of the unnatural circumstances in which they are placed under the microscope. This seems to explain how hot fomentations and poultices 'favor suppuration,' as surgeons say, in boils and abscesses. It explains also why suppuration is usually more rapid in deeply-seated, well-covered parts than in exposed situations."—(*Lancet.*)

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Syphilitic Cachexia.—"DR. AITKEN, the Professor of Pathology in the Army Medical School, Netley, contributes an admirable paper on Pulmonary Lesions associated with Syphilis, in a report to the Army Medical Department of England, of which the circulation has hitherto been by no means commensurate with its value. This paper is certainly destined to influence considerably the advance of our pathology in respect to constitutional syphilis, for army surgeons will find in it all necessary indications for pursuing this subject, and foreshadowings of the promise which such labors hold out. Dr. Aitken observes:—

"'Foremost among the evils engendered by syphilis is the *deterioration* of the constitution. A condition of ill health or cachexia is undoubtedly established, and the development of lesions essentially specific are brought about in many of the internal organs. There is, perhaps, no morbid poison—the paludal or malarious poison not excepted—which has so extensive a range of influence as the syphilitic poison. Hardly any organ is exempt from its destructive ravages; for its virus seems to exert its power chiefly on the connective tissue, and that tissue takes a part in the structure of every organ of the body.

"'The medical periodicals for several years past, as well as several monographs on the subject, and the records of the Pathological Society of London, have been mainly instrumental in demonstrating the very remote effects which syphilis exercise upon the organs and the constitution of man. Great advances have thus been made in the pathology of syphilis—advances which are due to clinical, experimental, and post-mortem observations. It has now been clearly shown that many doubtful cases of ill health are in reality due to the influence of the specific poison of syphilis, the morbid effects of which may not be fully developed till many months, and even years, after the primary infection.'

"He points out that the more remote effects of syphilis, as to which further definite information is to be desired, are—(1) the specific condition of constitutional ill health associated with (2) the definite structural injuries, and especially those new growths of connective tissue known as nodes, or gummatous tumors. Surgeons have long been cognizant of such gummatous growths or nodes of the periosteal investment of the bones, especially of the shin, skull, and clavicle, as among the commonest features of secondary syphilis; it is now known that they are developed in the lung, liver, brain, heart, voluntary muscles, testicles, and in the eyes. Dr. Aitken discusses with practiced skill the tests by which such growths are recognized; and while noting that the post-mortem examinations at the invaliding hospital of the army are extremely rich in syphilitic lesions, notes also that 'whatever explanation may be given of the fact, it is undoubted that a very large proportion of the cases dissected acknowledge in the history of their illness and ill health that syphilis was the starting-point.' Dr. David Milroy, Assistant Surgeon, 30th Regiment, gives also an important paper on pulmonary diseases and their relation to syphilis; and they both furnish notes of cases which clinically support the views expressed. Eminent civilians, such as Graves, Stokes, Walshe, and Virchow among physicians, and Ricord and Acton among venereal practitioners, have urgently directed attention to this subject: nevertheless it has not yet received that attention which it deserves; and in the recent able medical report from the physicians of the Consumption Hospital, on the last ten years of their experience, we do not find any reference to the subject. No doubt their experience will be found propor-

tionately less ample, when they turn their attention to this point, than that of army medical officers, who, in a limited number of autopsies, after death from pulmonary disease, find a large proportion of cases presenting syphilitic lesion of the lung. But, on the other hand, these lesions are not of themselves easily to be recognized, unless the mind of the observer be on the alert. We do not remember to have seen anywhere a more clear and rational account than that which Dr. Aitken gives in his paper; and believing that such description will possess great interest for all our readers, we think it right to quote his account of the character of syphilitic alteration of the internal tissues:—

"'The lesions just noticed eventually assume a great variety of anatomical forms; but in the first instance they are to be recognized in the typical form of *nodes* or *gummatous nodules*. The minute structure of these gummatous nodules has been closely examined by many observers. This gummatous nodule consists of a growth of elements which leads to the development of an elastic tumor composed of well-defined tissue, and the elements of which are extremely minute. The tumor takes origin from the connective tissue or the analogues of such; and hence the universality of the site of syphilitic lesions. When these are sufficiently large to attract attention, as in the form of a node on the shin-bone or on some part of the true skin, they are small, solid, pale knots, like a hard kernel, about the size of a pea. They are generally first seen on some part of the true skin or subcutaneous or submucous tissue; and when the tissue in which they happen to grow is sufficiently lax, they grow to a considerable size, and convey to the touch a sensation as if they were filled with gum Repeated examinations of this growth show that in its gelatinous or soft state it arises from a prolification of nuclei among the elements of the connective tissue, not unlike the formation of granulations in a wound. The component cell elements appear as round, oval, or oat-shaped particles imbedded in a matrix of fine connective tissue of a granular character, and tending to fibrillation. The cell elements are a little larger than blood-globules, and are distinctly granular in their interior when mature. In the growing part of the node, and immediately in its vicinity where growth is abnormally active, the minute cell elements are seen to be developed in groups within the elongated and enlarged corpuscles of the connective tissue. In form, therefore, the node or gummatous nodule resembles a tubercle, and, by fatty degeneration or tuberculization, may not be capable eventually of being distinguished from tubercular deposit. How, then, are we to recognize the specific nature of such gummatous nodules? There is nothing in them so specifically and anatomically distinct that, apart from their history, they can be recognized. The history of the syphilitic case during life is the great guide. The nodes on the shin-bone or clavicles have long been recognized as the product of syphilis. It may almost be said that they have been seen to grow under the eyes of the patient and the observer; and their anatomical characters are found to be such as compose the gummatous nodules just described. In a case of inveterate syphilis, therefore, whose history is fully known, in whom the node on the shin is characteristic and has been seen to grow, and in whom also we find similar nodules in the lungs or in the liver and in the testicles—symmetrically growing in these latter organs—and consisting of minute cell elements exactly the same as the node on the shin, it is impossible to overlook the fact, or not be impressed with the belief, that all these lesions acknowledge one and

the same cause of development, namely, the syphilitic poison, of which they are the expression. The progress of the node is also characteristic and suggestive. Growths of a similar form which result from idiopathic inflammation generally proceed to the formation of an abscess, or to the hypertrophy of fibrous tissue. Abscesses are recognized by their pus; fibrous tumors or hypertrophies by the fibre elements which compose them.

"'Growths of a form similar to the node, which result from cancer, are in general to be recognized by the juice expressed from them. In the gummatous nodule we have no juice; and the cell elements seen in cancer are generally so diversified in their form and mode of growth as not to be easily mistaken. The gummatous nodule is uniform as to the size and form of its cell elements, and forms growths less highly supplied with blood-vessels than cancers. Cancers also tend to infiltrate and involve neighboring textures; the gummatous nodule remains isolated and distinct.

"'By way of elimination, therefore, and by duly observing the history of the case, we are generally able to recognize the nature of such growths, and to assign to them their proper places in pathology.'"—(*Ibid.*)

"*Deformity of the Cheek, associated with Hare-lip.*—An infant was submitted to operation for hare-lip, in King's College Hospital, on the 21st inst., the fissure being on the left of the mesial line. But associated with this deformity was another, consisting of slight extension of the left angle of the fissure of the mouth into the cheek, yet with a continuous line toward the jaw, resembling a cicatrix. This gave to the cheek above a very prominent and peculiar appearance. Mr. Fergusson observed that he had met with two instances wherein the mouth was continued into the cheek; and it is a deformity very seldom brought under observation."—(*Ibid.*)

Gingival Diphtheritis.—The Edinburgh correspondent of the *Lancet* states that Dr. Matthews Duncan read a paper upon this subject before the Medico-Chirurgical Soc. of that city. "From the description of the cases, they were considered by Dr. Moir, Prof Simpson, etc., to be cases of aphthæ, such as are not rarely met with—a view which was most indignantly objected to by Dr. Duncan, who was not likely to mistake aphthæ for diphtheria; and said that it was not usual in cases of the former to be able to tear off considerable portions of diphtheritic membrane from the gums, which was reproduced next day. In the cases described, there were extensive patches of diphtheritic membrane which did not extend from the parts first affected, and were not acccompanied by any marked constitutional symptoms, nor did the cases require any other than mild alterative treatment."

"*Necrosis of Lower Jaw.*—Dr. Voss presented two sides of the lower jaw, together with several smaller pieces, which he had removed from a child, seven years of age, on account of necrosis. The doctor saw the child for the first time in October last, and found the jaw very much swollen; and there was also a fetid discharge from some fistulous openings in the mouth. By introducing a probe into these openings, the nature of the disease was readily discovered. Previous to the attack of periostitis, which, by the way, occurred simultaneously on the two sides,

the child had never suffered from any sickness. The dead portions of bone were removed from the inside by enlarging the fistulæ, and consisted of the two articular processes, coronoid processes, angle, and that portion of the body of the bone not included in the chin. Subsequently to this, various other pieces of bone were removed, including several of the teeth. The patient made a good recovery, the wounds healed up kindly, and new bone has appeared in place of that which has been removed There is no deformity perceptible, save a retraction of the chin, and a want of prominence at either angle of the jaw. In consequence of this retraction, the tongue is thrown back somewhat upon the larynx, and the child has a slightly noisy respiration.

"Dr. Elliot remarked that, in a case where Dr. Carnochan removed the entire lower jaw, the deformity was not enough to be noticed by any save a professional person.

"Dr. Garrish referred to the case of a child, five years of age, who lost three-fourths of the lower jaw by necrosis, the result of salivation from only four grains of calomel given at a dose.

"Dr. Voss stated that there were no evidences of either phosphorus or mercury acting as a cause of the disease; in fact, he was at a loss to decide what was the cause, unless, perhaps, the second dentition might have had something to do with it. It was certainly very strange to him how both sides of the jaw were simultaneously affected."—(*Amer. Medical Times.*)

"*Tumor from the Roof of the Mouth.*—DR. CABOT showed to the Soc. for Med. Improvement a small round tumor which he had removed from the roof of the mouth of a soldier. It had existed for eighteen months. It was situated on the posterior and left part of the hard palate, extending as far as, but not involving, the gum. Although the patient had suffered severe pain in the left side of the face and temple of a neuralgic character, yet he was not sure that it had its origin in the tumor. It was somewhat tender on pressure, but not painful. The capsule which contained it being incised, it was easily shelled out. It was two-thirds of an inch in diameter, of a yellowish-white color, and mostly smooth; but in one part, it had a watery appearance."—(*Boston Med. and Surg. Journ.*)

Silicium Compounds. By F. WÖHLER. Annalen der Chimie und Pharmacie.—"The bodies described in the following memoir are obtained by means of a compound of silicium with calcium, the mode of preparing which and the composition must first be mentioned.

"This *silicide of calcium* is procured by fusing together silicium, chloride of calcium, and sodium. The best proportions appear to be, 20 grammes of crystallized silicium,* 200 grammes fused chloride of calcium, and 46 grammes of sodium. The process is as follows: The silicium, rubbed to a fine powder, is intimately mixed with the powdered chloride of calcium in a hot mortar; the mixture is then transferred to a warm cylinder, and about half the sodium, which has been quickly cut into small pieces, is immediately added to it. The cylinder is then closed, and the

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* Silicium may now be cheaply prepared by means of aluminium. One part of aluminium is fused with five parts of powdered glass, and about ten parts of cryolite. The black regulus must be powdered and treated with hydrochloric acid to remove the aluminium, and the remaining silicium treated with fluoric acid.

sodium is thoroughly mixed with the other ingredients by well shaking; in this way also the oxidation of the sodium is prevented. While this is being done, a Hessian crucible must be brought to a full red heat in a wind furnace. Some fused common salt is put at the bottom of the crucible, and on this is placed the other half of the sodium in a single piece. The mixture, made as above, is now quickly dropped into the crucible, a layer of fused common salt is placed above it, and the mass is quickly pressed together. The crucible is now covered, and the heat is increased. When no soda flame is seen to issue from under the cover of the crucible, the heat is raised to about the melting point of iron, and continued for half an hour. When the crucible has cooled it is broken; and if the operation has been successful, a button of the silicide of calcium will be found, which can easily be freed from the slag. It must be preserved in a dry, well-closed vessel.

"Silicide of calcium possesses the following properties: It has a lead-gray color, a perfect metallic lustre, and a crystalline laminated structure. The crystalline structure and lustre are best seen on the upper surface of the fused mass, and single granules have planes which show that they have an hexagonal form. In the air, the button slowly disintegrates, forming a mass of lustrous scales like graphite. The same change happens when it is placed in water, and is then accompanied with the evolution of hydrogen. The water becomes alkaline, and contains soda, hydrate of lime, and some chloride of calcium. The substance increases in weight, and on analysis shows a loss, which is, of course, occasioned by oxygen taken up by a part of the calcium and silicium, the oxidized compounds formed not being perfectly soluble in the water.

"The strongest nitric acid does not attack the silicide of calcium, as might have been expected; Bunsen having observed that calcium itself remains unchanged in that acid Nitric acid extracts lime from the mass disintegrated by water, without, however, destroying the metallic lustre of the scales. These, after having been washed and dried, evolve hydrogen when heated in a tube, proving that they contain the silicium compound which is about to be described.

"The most remarkable action of the silicide of calcium is its behavior with hydrochloric acid, by which it is changed into an orange-yellow substance, a brisk evolution of hydrogen taking place. Dilute sulphuric acid, and even acetic acid, effect the same change. Hydrofluoric acid produces the same effect much sooner; but, in this instance, the yellow substance soon turns white. Heated to redness in the vapor of water, (?) the silicide remains unaltered.

"From what has preceded, it will be evident that besides the principal ingredient—the silicide of calcium—the mass still contains sodium; it also contains free silicium, which, like aluminium and zinc, seems to have the property of dissolving in a fused mass, and crystallizing out on cooling. Aluminium, magnesium, and iron were also present when the materials used in the preparation were not pure. * * * * *

"Chloride of calcium fused with silicium without sodium, suffers no decomposition, the silicium taking up no trace of calcium. * *

"It is only by means of this compound that we can with probability explain the composition and mode of formation of the yellow body which is obtained by the action of hydrochloric acid, and which I shall now describe under the name of *Silicon*.

"Silicon is prepared in the following way: The silicide of calcium ob-

tained in the manner just described, roughly powdered or disintegrated by water, is treated with concentrated hydrochloric acid in a vessel, which must be placed in cold water to prevent the heating of the mixture. An evolution of hydrogen soon takes place, and the silicide is gradually transformed into silicon. The mixture must be often stirred, to bring the powder entangled in the froth in contact with the acid, and then left for some hours in a dark place, until the evolution of gas has ceased. It is then diluted with six or eight times its volume of water, the silicon filtered out, carefully protected from the light, well washed, then pressed between folds of bibulous paper, and lastly dried in a vacuum over sulphuric acid, the bell-glass being covered with a black cloth.

"Silicon is of a bright, orange-yellow color. It is composed of transparent, yellow laminæ, which may be only pseudomorphs of the crystalline silicide of calcium. It is insoluble in water, alcohol, the chlorides of silicium and phosphorus, and also sulphide of carbon. When heated, it becomes of a darker orange-yellow. On applying a stronger heat, it takes fire, with a faint deflagration and some sparkling, leaving a residue of silicic acid, which is colored brown by some amorphous silicium. Heated without access of air, it evolves hydrogen, and leaves behind a mixture of silicic acid and amorphous silicium in the form of glistening, blackish-brown scales. The evolution of hydrogen ceases when a full red heat is reached. If not prepared with the strongest acid, it contains the colorless compound to be presently described, and is then of a lighter color. When this is heated in a tube, it undergoes a sort of deflagration with the simultaneous evolution of the self-inflammable siliciuretted hydrogen. The decomposition of silicon by heat begins at about 100°, so that when heated to that temperature with water, it evolves hydrogen, though slowly, and becomes paler. But when heated with water in a closed tube to 190°, it quickly changes into white scales of silicic acid, and the tube then contains compressed hydrogen.

"The behavior of silicon, when exposed to light, is very remarkable. In the dark, even when moist, it remains quite unchanged. In diffused light, it becomes paler; but in direct sunlight, it in a short time becomes perfectly white, and hydrogen is given off. When placed under water in sunlight, hydrogen begins to be evolved immediately, and continues, like a fermentation, until the silicon has become quite white. The purer the substance is, the more quickly does the change take place; and several grammes are transformed in a few hours. If, however, it has not been perfectly protected from the light in the course of preparation, it is much longer before the whole is altered in sunlight. I shall return presently to this white body.

"Silicon is attacked by neither chlorine nor concentrated nitric and sulphuric acids, even when heated. Fluoric acid with it becomes heated; it at the same time swells up, gradually becomes brighter in color, and at last is quite white.

"Its characteristic behavior is with solutions of the alkalies, by which it is changed into silicic acid, heat being developed, and an active evolution of hydrogen taking place. This happens even with the most dilute solutions of ammonia. With the carbonates of the alkalies, the change takes place more slowly.

"In the presence of an alkali, silicon acts as a powerful reducing agent on the salts of the heavy metals. Solutions of copper or silver salts soon become black, and a gold solution brown. From solutions of chloride of

palladium and osmic acid, on the addition of an alkali, it immediately precipitates a black powder. From a chloride of gold solution, made alkaline with caustic soda, it throws down a violet-black precipitate. All these black bodies appear to be silicious oxide, (oxidul-silicate.) From a solution of lead oxide in caustic soda, it throws down all the lead as a gray mass. It is only the hydrogen in a nascent condition, evolved by the co-operation of an alkali, which acts as the reducing agent.

"It is evident that the elements of silicon are silicium, oxygen, and hydrogen; but the conjecture arose whether it might not be a new hydrated oxide—a sub-oxide of silicium. The analytical results soon showed that this conjecture was untenable.

"The easy decomposibility with ammonia, presented a ready means of estimating the silicium. The substance dried in a dark vacuum was changed to silicic acid by dilute ammonia, the mass evaporated to dryness on a water-bath, then heated a little, washed with water, and the mixture of silica and silicium weighed. The silica was then extracted with fluoric acid, and the amount of free silicium weighed. The hydrogen was estimated by a combustion with oxide of copper as in an organic analysis. * * * * * * * * * *

"*Leukon.*—By this name I designate the white substance into which silicon is changed under the influence of light and water. Leukon retains the same form as the silicon. It is perfectly colorless, and appears to remain unchanged in the air. When heated, it takes fire and glows, leaving a residue of silica, which is colored brown by some silicium. By heating in a tube, hydrogen is developed, and sometimes also siliciuretted hydrogen, brown-colored silica being left behind. In the presence of alkalies, it behaves in the same way as silicon. The water in which it has been formed, dissolves a little of it; with ammonia, it evolves a little hydrogen, and reduces gold from the chloride. * * * *

"While, however, the existence and peculiarities of all these silicium compounds are well proved, there still remain doubts as to their real constitution, which only further researches can remove.

"Supplementary to these the author announces the existence of other still more remarkable compounds, whose true composition he has not yet been able to make out.

"When the silicide of calcium is acted on with very dilute and cooled hydrochloric acid it is not changed into the yellow silicon, but into a colorless compound, consisting of colorless nacreous scales. These are afterward separated by filtration, washed and dried in a vacuum over sulphuric acid. When air is admitted, and the new compound is taken out, it takes fire spontaneously in a few moments and burns, leaving a residue of brown silica. A second specimen showed the same phenomena, and was lost, although the vacuum had been filled with carbonic acid instead of air.

"Two other specimens did not inflame spontaneously, but they were yellowish and not colorless, and contained some silicon. When heated in the air, however, they took fire, and became incandescent; when heated in a tube they evolved siliciuretted hydrogen, leaving a brown residue of silica. In regard to the composition, we can only suppose that this compound contains more hydrogen than silicon. The analysis of one of the not spontaneously inflammable specimens gave 54·88 per cent. of silicium. If it had the composition $Si_8H_8O_{10}$, it should have contained 53·8 per

cent. The existence of this body explains why, when silicon is prepared with weak hydrochloric acid, a sulphur-yellow and not an orange-yellow body is obtained, which evolves siliciuretted hydrogen when heated in a tube.

"The behavior of silicide of calcium to hydrochloric acid in the presence of sulphurous acid is very peculiar, the latter acid alone having no action either on the silicide or silicon.

"When a large excess of aqueous sulphurous acid is poured over powdered silicide of calcium, and only a small quantity of hydrochloric acid is added, it quickly changes, without any evolution of gas, into a reddish-brown substance, composed of almost copper-colored scales. The liquor is at first colored brownish, but it suddenly turns milky, from the separation of sulphur, the greater part of which may be decanted. No further change is produced by the addition of more hydrochloric acid; when filtered and washed, however, the color changes, and sulphuretted hydrogen is evolved. After squeezing between paper it is dried in a vacuum, and the free sulphur extracted by sulphide of carbon.

"On being heated in the air it burns like gunpowder; when heated in a tube it inflames and explodes strongly, and spreads a smell of sulphuretted hydrogen; when heated very gradually, it evolves sulphuretted hydrogen, and the residue will not explode. When placed in water, however, sulphuretted hydrogen is developed, probably because sulphide of silicium has been formed, on the formation of which, perhaps, the explosion and sudden heating depended.

"With ammonia hydrogen is very quickly developed, and there is left a white mixture of silicic acid and sulphur.

"The analysis of an evidently impure specimen of the substance gave 43·2 per cent. of silicium. Supposing the before-mentioned sulphur compound to be $Si_8Cl_8S_{10}$, it ought to contain 40 per cent. of silicium.

"When a solution of selenious acid is poured over the silicide of calcium, and a little hydrochloric acid is added, a cinnabar-red substance is formed; dried in a vacuum, this smells of seleniuretted hydrogen. With ammonia it evolves colorless hydrogen; when heated it does not explode, but gives off seleniuretted hydrogen, and forms a sublimate of selenium. The residue is yellowish-brown, and with ammonia forms selenide of ammonium.

"Telluric acid, dissolved in hydrochloric acid and diluted with a good deal of water, changes the silicide of calcium into a grayish-black body.

"After drying it is odorless; when heated in a tube it does not explode, but gives off hydrogen and a sublimate of tellurium. The residue is black and glistening, and appears to be telluride of silicium, which, with ammonia or caustic soda, evolves hydrogen, and forms a purple red solution of telluride of the alkali. Here also is opened a wide and fruitful field for inquiry."—(*Chemical News.*)

"*Lead, its Impurities, and their Influence on its Technical Uses.* Read before the British Association at Newcastle. By WILLIAM BAKER, F.C.S.—The methods employed in this country for smelting lead from its ore are now almost entirely confined to the treatment of the crushed galena in a reverberatory furnace without any previous calcination. In some places the Scotch ore-hearth still exists, when a blast of air is used in the reduction. In all cases the rich slags from the reducing furnaces are smelted either in the slag hearth or in the Castilian furnace,

both of which are also worked with a blast. In the Castilian furnace poor ores are reduced along with the slags. The pig lead, as it is delivered to the manufacturers from these operations, is easily distinguished by its physical characters—and is known either as soft or hard lead. That which is smelted from an average good ore in the reverberatory furnace is always soft and fit for rolling or making into pipes. That which is smelted by the aid of a blast at a high temperature, even if the same ore is employed, is invariably hard. Of course there are different degrees of these qualities, but the distinction is marked between these two classes of lead.

"The characters by which pure lead is known are its softness and malleability—its appearance when melted, and its surface when poured out into a mould. Pure lead rolls without cracking at the edges; when melted and skimmed at a low temperature it is white, and possesses a smooth, mirror-like surface; and at a higher temperature the succession of colors produced by oxidation is by no means so variegated as in lead containing certain impurities. The surface of an ingot presents a confused and interlacing mass of arborescent or fern-like crystals, which impart an unevenness at the moment of solidification. A pig of such lead, when broken, (which may be done by carefully heating to a little below the melting point,) presents a white fracture, which is largely but irregularly columnar. These forms are due to the interference of the groupings of crystals, the lines not being themselves edges of crystals. I lay some stress on the whiteness of the surface, and of the fracture of pure lead, because many common qualities of lead present also a white appearance, which is, however, due to the presence of certain impurities, and may be as easily distinguished as the whiteness of silver can be from that of pewter.

"Such being the characteristics of pure lead, it is natural to inquire what are the impurities which render it hard, and what elements may exist in it without impairing the qualities which render it suitable for its various technical uses. The substances which commonly impart hardness to lead are sulphur, antimony, and arsenic. Copper, if alone, does not much affect the softness of lead; nor is iron, in the absence of sulphur, found in sufficient quantity to produce hardness. Ordinary soft lead generally contains from ·008 to ·010 per cent. of iron; but both iron and copper may be introduced to a considerable amount in the form of sulphides, in which case they, as well as the sulphur, impart hardness to the metal. At a high temperature several metallic elements in combination with sulphur will melt, become diffused in the lead, and render it hard. Phosphorus or phosphide of lead will not exist in the metal; for when phosphate of lead is reduced in a close vessel phosphorus may be distilled off, and the lead obtained quite pure and soft. At a low temperature only a trace of sulphur or sulphide of lead will remain diffused in the lead. But if the temperature is increased, so much sulphide may be melted and diffused in lead as to render it decidedly hard. This explains why pure galena smelted by a blast will give a hard lead. On remelting at a low temperature the bulk of the sulphide is removed, and what remains may be shown to be unequally diffused in the metal; for, if such a piece of lead be corroded, as in the process of making white lead, irregular particles of a dark color may be seen in the mass of white carbonate.

"In the process of oxidation of lead for making red lead, it has been the custom to add a pig of hard or slag lead to the charge for the pur-

pose of promoting the oxidation. I have melted together pure galena and lead in the proportion of 2 per cent. of the sulphide, and produced a hard lead which answered the purpose quite as well as the slag lead usually employed.

"Antimony, tin, and zinc impart a whiteness to lead, each peculiar to itself. Zinc is, however, seldom found in lead, and tin exists in but small quantities; antimony is the chief element which, with sulphur or alone, gives the characteristic hardness and whiteness to slag lead. At the high temperature of the blast furnace therefore we may have sulphides of antimony, copper, iron, and arsenic diffused in the lead as it is reduced and runs down into the kettle. Such is the hard lead which must be specially treated before it can be used in the arts.

"Refining processes for impure lead are essentially oxidizing processes. When the amount of antimony is not more than 1 to 2 per cent., as in Derbyshire slag lead, the pigs are placed on the bed of the ordinary reducing furnace, and melted down with free access of air. This is really a liquation as well as an oxidizing process; the separation of the lead from its impurities being effected by taking advantage of the difference between the melting points of lead and the mixed sulphides—the latter being left on the bed of the furnace, while the purified lead in an oxidizing atmosphere runs into the pot. I have introduced an oxidizing agent for effecting the softening of slag lead as it is tapped from the blast furnace. If nitrate of soda be stirred into the lead while kept at a heat just below redness, the sulphides are immediately attacked, and, instead of the white smooth surface it first possessed, a play of iridescent colors and a wrinkled surface disclose the characteristic appearances of ordinary soft lead. When a large quantity of antimony is present, as in most Spanish leads, the metal is treated in an improving furnace, where it is calcined or subjected to an oxidizing flame for a length of time, varying with the hardness of the lead. The rich antimonial slags are resmelted, and ultimately a product is obtained from them which may contain 20 to 30 per cent. of antimony. A method of separating lead and antimony is yet a desideratum in metallurgy. The softened lead is treated by Pattinson's process for the concentration of the silver.

"Softened lead may still contain traces of antimony, sulphur, tin, and iron, and a yet more notable quantity of copper. If free from tin and antimony, it gives a fine display of colors on melting; and on increasing the temperature the film of litharge which is formed cracks in all directions, showing, when the lead is agitated, a wrinkled surface, characteristic of soft lead. Softened lead breaks with a fibrous, not with a granular fracture, and the fractured surface is usually colored with purple and blue tints."—(*Ibid.*)

"*Chloroform Gelatinized.*—Chloroform, as well as ether, possesses the property of intimately mixing with albumen, first forming a liniment and then a light jelly, which is often of much more easy application than the volatile substance which gives rise to it. M. Grimault supplies a formula for its preparation, independently of any pharmaceutical apparatus. It suffices to shake up in a phial, two volumes of white of egg, and one volume of chloroform. Providing that the chloroform be pure, or at least is devoid of foreign bodies (alcohol or acid, for example) liable to coagulate the albumen, the jelly forms of itself, and can be preserved for several days without separation."—(*Bull. de Thérap.* and *Dublin Medical Press.*)

THE

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ORIGINAL COMMUNICATIONS.

PRACTICAL HINTS.

BY J. D. WHITE.

Diagnosis of Toothache.—It will not be possible to give all the cases of toothache which occur in practice from day to day, or perhaps the *distinctive* diagnosis of each case, but enough may be said to lead to a better understanding of it than generally obtains.

Case 7.—A lady about fifty years of age called to consult us a month ago. She had but six teeth in the mouth,—the six lower front ones. She had been wearing artificial teeth, upper and lower set, about ten years. The plate of the lower set had displaced the gum to some extent on the posterior parts of the natural teeth, and somewhat worn them. There was no decay about the teeth, or apparent inflammation of the gum. The pain was of a lancinating character, running along the lower jaw, right side, and sometimes seemed to locate itself in the canine tooth of that side. The pain was most severe when the artificial teeth were in. The gum was some little irritated on the back parts of the teeth, but no one more than another. There was no soreness of the teeth to the touch; so it was difficult to determine from which tooth the pain originated. We instructed the patient to let the artificial teeth remain out of the mouth. We scraped around the necks of the teeth, to remove all foreign substances or sediment, and to cause them to bleed freely, to obtain as much local depletion as possible, and applied a large wad of cotton, saturated with laudanum, to the parts around the teeth. The pain subsided for a few days, when it returned again, but was most severe in the canine tooth. We proposed to drill the tooth, and destroy the pulp. This the patient did not like, and proposed to bleed the gums, and try the cotton and laudanum once more. This was done, and the pain subsided, but returned in a few days again. There was no discoloration of any of the teeth, as is sometimes the case in inflammation of the pulp; and no soreness to the touch,

except that the pain was located, and most severe, sometimes in the canine tooth. There was no positive evidence in which of the three teeth on that side of the median line the pain really originated. The case was let go for about two weeks, the pain coming and going at intervals, until one night it became intense, when the patient called to see us again. We found the second lateral incisor a little sore to the touch. We drilled it open at the neck, applied arsenical paste, as the pulp was living and intensely sensitive. The pain subsided in a short time—about one hour—and has not returned. We have removed the pulp as far down the root as convenient, and we may some time plug it, especially if decay should set in. We were very nearly drilling the wrong tooth in this case. When the pain under such circumstances is not well located, we think it best to wait until some difference in the touch indicates its precise locality.

Case 8.—An old gentleman was sent to us some time since by a distinguished surgeon, suffering with pain in the canine, lateral, and front incisors of the lower jaw, left side. He had but the six front teeth—lower jaw—in the mouth, precisely like the lady above alluded to, but wore no artificial teeth. These six teeth were all sound, except slightly worn from former contact with the upper ones. No inflammation in the gums. He, as well as his surgeon, thought it would be best to extract the front incisor, left side, as it was the most painful. His case looked like the former one described, but was unlike it. There was no tartar at all about the teeth; no rubbing of a plate on them; no contact with upper teeth. They were perfectly natural in appearance. On putting the question to the patient,—have you any unnatural sensibility of the lower lip on that side of the mouth when it is touched with food or the finger? he said, yes. I cannot touch my lip at all; sometimes cannot move it in eating; it feels as if it were blistered. We said to him: when the neuralgia goes away, the toothache will disappear also. We know a great many patients who had their teeth extracted under such circumstances, without affording permanent relief. It is necessary for every dentist to know the difference between neuralgia and toothache.

(To be continued.)

MECHANICAL DENTISTRY.

BY C. P. FITCH, M.D.

Read before the Society of Dental Surgeons of the City of New York.

Mechanical Dentistry, in its broadest sense, embraces to some extent a knowledge of Anatomy, Surgery, Physiology, Physiognomy, Chemistry, Mineralogy, Metallurgy, as well as a knowledge of Mechanics and Dynamics. But, in its usually accepted signification, it simply has reference to

the contribution made by art to supply the loss of the natural teeth; and when we have accomplished our most perfect productions, we are still far below nature—mere copyists, at the best—and often we have the sad experience of realizing that our best efforts have been attended with signal failure.

In the artificial, the main object of the artificer is to supply all that has been lost in the natural. In reference to artificial dentures, in this sense it is impossible. But, approximately, our American dental profession has accomplished that in artificial dental substitutes which challenges successful competition, and commands the admiration of the world. Not that we have reached the ultimatum; but that artificial dentures are now being produced in this country, aye, in this city, that so nearly resemble nature, in adaptation and appearance, as to deceive the nicest discrimination of those claiming superior ability in detecting, at a glance, the natural from the artificial.

In further discussion of this subject, I wish particularly to consider the nature of that loss, arising from extraction, which manifests itself in the change of facial expression, and when and how far it is susceptible of restoration by art.

I do not, in the outset, take the position that there are no instances where the natural facial expression, or, in other words, the natural features, from dental malformation, could not be improved by art. But all such cases must be regarded as the exception, and not the rule. The change of facial expression is doubtless due more to the absorption of the alveolar border than to the loss of the crowns of the teeth, though both contribute their share in producing the changed condition. The loss of the alveolus, with but very few exceptions, is due to the extraction of the roots of the teeth. The extraction of particular teeth contributes to this sad result much more than others. The osseous structure constitutes the framework over which the muscles are stretched, from which they take their origin and mostly have their insertion, by white, fibrous, non-elastic substance. The sharp outline of the features is to a great extent attributable to muscular tissue; but the harmonious play of the features, or, in other words, the harmonious action of the muscles, depends very much upon the proper development of not only the muscles themselves, but of the bones upon which they rest, and also depends upon the preservation of this osseous substance in its full normal condition. Destroy or displace the nasal bones, and at once that very important and conspicuous feature of the face gives unmistakable proof of the loss. So destroy the alveolar processes, and the muscles which lie upon, or contiguous to them either contract or are depressed, and give the face a shrunken or pinched appearance. The muscles mostly affected in the disappearance of the alveoli are those situated about the mouth and at the wings of the nose, though the normal action of muscles farther out upon the face is more or

less interfered with. I will mention, in passing, a few of these muscles. *Orbicularis oris:* this is a sphincter muscle, elliptical in its conformation, its fibres passing elliptically around the mouth. It forms the oral opening. Into the substance of this muscle many muscles are inserted. The *levator labii superioris alæque nasi:* this muscle is the elevator of the upper lip and the wings of the nose. It takes its origin from the nasal process of the superior maxillary bone, passing downward and outward, and is inserted into the alæ of the nose, the *orbicularis* and the *levator labii sup. proprius.* Without giving the origin and insertion, I will name others: the *depressor alæ nasi* the *levator labii superioris*, the *buccinator*, the *risorius*, or muscle of Santorini, the *levator labii inferioris*, and the *depressor anguli oris;* the *zygomaticus*, major and minor, with others, are muscles of expression. It will be readily understood, from the extent of muscular structure involved in the loss of the alveolar ridges, why it is we have so great a change in the facial expression where these bony processes are absorbed.

It will be very apparent to you, I think, to the loss of what particular teeth the greatest facial change is mostly chargeable. It is, unquestionably, those teeth which involve in their extraction the greatest muscular change. And this muscular change is more extended and complicated in the loss of the cuspids than any other teeth of the mouth. In their loss, most of the muscles above enumerated are more or less affected. If atrophy of these muscles does not ensue, yet the disappearance of the bony framework, from which they either take their origin or upon which they rest, causes their contraction or their depression, and consequently gives to the face a constricted aspect. A question very naturally arises in this connection. Should these teeth or their roots ever be removed, for any cause whatever, aside from the claims which arise from their diseased condition, which at times calls for the prompt action of the dental surgeon? The proper answer to this question will be quite apparent, when another very important question has been solved, viz.: Can the facial changes induced, or the structure lost in their removal, be substituted by an artificial appliance? For, if the loss can be but partially restored, or, in other words, if the deformity can be but partially removed, the importance of retaining these teeth, or especially their roots, in the mouth, is very much enhanced. The roots of the cuspids are larger and longer than any other teeth. They extend much beyond the commissure of the lip and gum, consequently their extraction is followed by a loss of structure about the alæ of the nose, which it is utterly impossible to replace by any artificial means whatever. It is true we may approximate a restoration, yet, from the fact that the loss occurs beyond our reach, renders its accomplishment impossible in any other way than to induce an osseous formation to take the place of the root, at least above the alveolar commissure. You will therefore please note that I wish to be understood as answering the first question decidedly in the negative.

Especially is it very desirable to retain the cuspid teeth whenever their roots are found to be large, and particularly does it become a matter of much importance should they be very lengthy; for under these circumstances, if these teeth are extracted, we either ignorantly or designedly inflict a lifelong deformity upon our patient. Of course, there are instances met with where it would be better to remove these roots. Mark you! I do not say teeth. What is the condition which seems to warrant their extraction? Pain from exposure of pulp? No. Ulceration or abscess at the apex of the root? No; not by any means. Necrosed bones? Not necessarily. What is it, then? Simply decomposition of the root itself. And where this has extended so far as to constitute them a source of constant irritation and the origin of much unpleasantness, their remains had better be removed. But whenever tooth substance sufficient to which to anchor a stopping, remains, I should by all means introduce one. But if the crown is gone, and the root remains sufficiently undecomposed, I should, after thoroughly protecting from further decomposition, either extend the plate over the root or attach the artificial piece to it by a metallic pivot, running from the plate into it. In case of adopting the latter method, the base of the artificial substitute could be constructed much narrower, covering a more limited portion of the alveolar prominence. I have seen artificial substitutes thus attached to these roots used with great satisfaction for twenty-five years, the wearer not realizing, for most of this time, that they were artificial.

The idea, which is prevalent with some, that suction-plates cannot be fitted around cuspid teeth so as to secure a firm adjustment sufficient to subserve practical uses, is simply a mistaken one, and whoever takes this position must lay himself open to severe criticism, if not, by existing facts, obliged to abandon it.

The loss attending the other teeth by extraction may mostly be supplied by art, so far as concerns the restoration of the features. But the principles governing the practice of every dentist should be, to save all the natural teeth possible. The necessity of resorting to artificial dentures is an evil, however perfect the substitute. It is, however, a question of choice in reference to the measures adopted for supplying this necessity. And it should be the business of the dentist to be so well up in every department of his specialty that he produces, in his every operation, that which will prove to be the least evil in its practical workings. But when the reasons for adopting this or that method are about equally balanced, he had better make a frank statement of the matter to the patient, and consult his choice. But when the best method is clear in his own mind, he should never be moved from a conscientious discharge of his whole duty. Better lose the patient than stultify conscience, or consent, for a moment, to perform that for him which is anything below his highest conceptions.

New York, December 2, 1863.

OBSERVATIONS ON THE ANAESTHETIC CALLED "MUHRITE OF OXYGEN."

BY ALFRED M. MAYER,
Prof. Chemistry in Baltimore College of Dental Surgery and in the Maryland College of Pharmacy.

THERE has recently appeared a gaseous anæsthetic which has received much notice, and is now used extensively by the profession to produce anæsthesia in dental surgery.

Requested to examine this new agent, I gave as the result the following report:—

This gaseous anæsthetic is prepared by heating a white crystalline salt at a temperature of about 500° Fahr. The salt first melts and then boils away, being resolved entirely into vapor of water and into a permanent gas, which can be collected over water in a gasometer. The salt was subjected to a thorough qualitative analysis for all the bases and for the mineral and vegetable acids, and the result was that *ammonia* and *nitric acid* were alone found to be present.

The gas which is evolved from the salt, I found, on analysis, to be pure *protoxide of nitrogen*, called also nitrous oxide and laughing gas.

The white appearance of the salt is produced (evidently for masking the well-known crystalline character of nitrate of ammonia) by heating the nitrate at the temperature of about 200° Fahr.

I now prepared pure protoxide of nitrogen and also several gallons of the so-called "muhrite of oxygen." On administering equal quantities of the two gases during equal times, precisely the same effects ensued. If the gases were breathed for about thirty seconds and then taken away from the patient, violent muscular action, attended with earnest declamation, immediately followed and continued for about one minute; the subject suddenly coming to his physical and mental equanimity. When, however, the gases were breathed for about one and a half to two minutes, complete repose is produced, attended with perfect anæsthesia; for on pinching and severely puncturing the patient, he had no consciousness thereof, nor did he flinch under the operation.

It is easy (generally) to administer the gas until complete anæsthesia is produced, for after the first four or five inspirations, the patient eagerly desires more, and this desire seems to continue even after anæsthesia has resulted.

The anæsthesia, in the case mentioned, lasted about one and a half minutes. In its exciting effects it appears analogous to the action of small doses of ether and chloroform.

Curious to know whether Sir Humphrey Davy, who first examined the properties of protoxide of nitrogen, had noticed this generally unknown anæsthetic effect, I turned to the edition of his works edited by his brother, Dr. John Davy, London, 1839—the third volume of this edi-

tion being entirely devoted to his "Researches on Nitrous Oxide." The following passages were found, referring in strong language to its property of producing insensibility:—

Page 271. "This was succeeded by an uncommon sense of fullness in the head, accompanied with *a loss of distinct sensation and voluntary power.*"

Page 273. "Whenever its operation was carried to the highest extent, the pleasurable thrilling at its height, about the middle of the experiment, gradually diminished; *the sense of pressure on the muscles was lost; impressions ceased to be perceived;* and voluntary power was altogether destroyed."

Page 276. "In one instance, when I had *headache* from indigestion, it was immediately removed after a large dose of the gas, though it afterward returned, but with much less violence. In a second instance, a slighter headache was wholly removed by two doses of the gas."

Page 276. "In cutting one of the unlucky teeth called dentes sapientiæ, I experienced an extensive inflammation of the gum, accompanied with great pain, which equally destroyed the power of repose and of consistent action. On the day when the inflammation was most troublesome, I breathed three large doses of nitrous oxide. The pain always diminished after the first four or five inspirations, the thrilling came on as usual, *and uneasiness was for a few minutes swallowed up in pleasure.*"

Page 286. "The headache and debility, however, still continued with violence; I examined some nitrous oxide which had been prepared in the morning, and finding it very pure, respired seven quarts of it for two minutes and a half. I was unconscious of headache after the third inspiration; the usual pleasurable thrilling came on; *voluntary power was destroyed;* and vivid ideas rapidly passed through my mind."

Page 291. "The mode of operation is somewhat altered. It is indeed very different at different times. *I am scarcely ever excited into violent muscular action.*"

Page 297. Letter from Mr. J. W. Tobin to Sir Humphrey Davy, on the effect of nitrous oxide. "I rarely feel sublime emotions or increased muscular power."

Page 299. Letter from Dr. Kinglake. "As on the former occasion, it immediately proved agreeably respirable, but before the whole quantity was quite exhausted, its agency was exerted so strongly on the brain *as progressively to suspend the senses of seeing, hearing, feeling,* and ultimately of power of volition itself."

Page 309. Detail of Mr. T. Poole. "In a few seconds the feelings became pleasurable; all the faculties absorbed in the fine, pleasing feelings of existence; *without consciousness.*"

Page 321. Observations by Dr. Beddoes. "Several times I have found that a cut which had ceased to be painful has smarted afresh, and on

taking two doses in succession, the smarting has ceased in the interval and returned during the second respiration. I had no previous expectation of the first smarting."

In the résumé, given by Davy in the conclusion of his "Researches," is the following remarkable passage, standing alone in the page, forming a paragraph by itself. "As nitrous oxide in its extensive operation appears capable of destroying physical pain, it may probably be used with advantage during surgical operations in which no great effusion of blood takes place."

We thus find that Sir Humphrey Davy's fine genius discovered, in 1799, (nearly 65 years ago,) that protoxide of nitrogen was an anæsthetic agent.

Laboratory of Dental College, Dec. 17, 1863.

DENTAL POLYCHRESTS.

BY W. H. ATKINSON, M.D.

1. Pure creosote.
2. A saturated solution of resublimed iodine in pure creosote.
3. Officinal tincture of iodine.
4. A saturated solution of pure iodine in Price's glycerin.
5. Officinal wine of opium.
6. Pure chloroform. (American, by Squibb, of Brooklyn, and the Scotch are preferable.)
7. Camphor gum.

These seven articles, singly and in various combinations, may be made to fulfill almost any indication desired by the dentist.

Dr. Ziegler, of Philadelphia, suggests that various indications may be met by a combination of camphor, iodine, creosote, and chloroform, or substituting for differing conditions, arnica, morphia, or aconite, instead of the chloroform.

Creosote in its pure state acts primarily as a painful escharotic upon denuded or delicate cuticular surfaces, with a secondary soothing, intoxicating, and sometimes blissful reaction very grateful to the patient. No fungous growth can long resist its continued application.

The rule is to repeat as long as pus is formed on the surface or prurient molecules spring up, but never repeat so long as the eschar of the former application remains attached.

In some organizations the epithelium exfoliates in twelve hours, while in others it requires forty-eight hours or more to desquamate the dead pellicle.

Iodine in creosote acts much like the above, but is more penetrating, making a deeper eschar and more rapidly polarizing (hardening) the new granulations, the growth of which it has the power to hasten when not

too abundantly applied. It is better adapted to the more malignant cases than creosote alone.

Tincture of iodine may also be made to cause slough if used in sufficient quantity and kept pressed upon the part, but its principal use is as a stimulator to granulation and a hardener of the molecules to the standard of health normal to the part.

The glycerole of iodine is better adapted to the more benign forms of aphthæ and gum boil when very circumscribed and mild.

Wine of opium is a good soothing stimulus to weakened mucous membranes or newly formed plasm out of which we desire to generate the new part. Used generally after or in alternation with simple tinct. iod. after pus has been nearly or quite prevented from forming.

Pure chloroform is a powerful stimulus, and if confined closely upon the part is escharotic to some extent on weak tissues.

Camphor, as is well known, is almost a universal antidote or modifier, in greater or less degree, of the actions of other drugs.

Its especial use to the dentist is best displayed in its ability to deodorize creosote, in which it is very soluble. About twenty grains to the ounce is capable of covering the peculiar smell of creosote which is so very objectionable to some persons. It is a great modifier of the escharotic character of creosote without impairing its antiseptic qualities as an application to all cavities before filling with gold or other material, which has so signally blessed all those who have resorted to it for this purpose. Thus used it enables the dentist to preserve a stratum of decalcified dentine as a cap to protect the pulp with perfect impunity.

The very general prejudice against creosote, iodine, and camphor arises from ignorance of their properties and the best way to use them. These, as well as all other remedies, should be used with direct reference to the patient's good rather than to our convenience, and as delicately and neatly as possible.

He who uses an instrument or a remedy in a bungling and awkward manner proves his lack of fitness for his place more than his lack of knowledge how best to administer to his own personal interests and advancement. Even a blunder handsomely and delicately apologized for will go further to advance a man's usefulness and reputation than the deepest erudition harshly and coarsely announced and put in practice. First be sure that all your purposes are clean, then be careful to prepare yourself to administer your polychrests in the most attractive and intelligent manner, and my word for it, you will never have cause to discard nor limit their range of usefulness as the nature of their adaptability increasingly unfolds to your improved power of perception of adaptation of means to ends.

New York, December 22, 1863.

INTERESTING CASE OF ULCERATION OF THE LINING MEMBRANE OF THE MAXILLARY SINUS.

BY HENRY C. QUINBY,
Honorary Dentist to the Liverpool Homœpathic Dispensary.

Judging from the very small number of cases of disease in this cavity reported in the journals of the profession, it may not be uninteresting to the readers of the Dental Cosmos to peruse the following report of a case that has afforded me much gratification from the readiness with which it has yielded to, and the complete success of, the treatment.

October 15th, 1863, Mr. Tucker, the house surgeon, called my attention to the case of Elizabeth Camperthur, a strong, healthy, married woman, aged thirty-four, who was suffering from severe neuralgic pains in the left side of the face, which appeared much swollen from near the end of the fang of the left superior cuspidatus to a little beyond the fangs of the first left superior molar. On looking into the mouth, I found all the upper teeth on this side perfectly sound; but a tumor of considerable magnitude appeared on the left side of the palatine arch. This, together with the situation and extent of the swelling in the face, led me to suspect that the seat of the disease was in the antrum.

In answer to questions, she stated that she had been subject to such swelling of the face, accompanied by more or less pain, since her sixteenth year; but had no recollection of any blow or accident affecting the face at that time or subsequently; and that she had twice had a discharge of offensive matter through the gum above the bicuspid teeth. At the present time, she had been suffering continuously for four months.

I extracted the second bicuspid, intending to penetrate the antrum through the socket of that tooth. The end of the fang presented that appearance of absorption so common in long-standing cases of alveolar abscess; but no discharge different from that in an ordinary case of extraction followed. I found, however, that a probe passed readily into the antrum, when its movement was slightly obstructed as if passing through rather soft lard. I then forcibly injected some tepid water, when a large quantity of solid, grayish matter of an exceedingly offensive odor came away, evidently sufficient to quite fill the cavity. I continued the injections as long as they brought away anything with them, then dismissed her to return on the 17th.

Mr. Tucker ordered a pillule of merc. sol. 3; three times a day.

October 17th.—Much better, scarcely any pain, and swelling much reduced. Injected freely with—

℞.—Argenti nit., grs. ij;
Aqua dist., ℥viij. Mix.

Followed with tepid water. Medicine repeated.

October 27th.—Has not had any pain. A very slight discharge of pus three days after the last visit. Repeated the injections as before, which brought away a little blood. Medicine repeated.

November 3d.—No discharge since last visit. All the unfavorable symptoms have disappeared. Considers herself quite cured. Injected with water only.

November 10th.—Discharged. Cured.

LIVERPOOL, November 14th, 1863.

LOSS OF THE UVULA.—REPRODUCTION OF A PORTION OF THE SOFT PALATE.

BY GEO. S. FOUKE.

THE following case of the loss of the uvula and a portion of the adjacent soft palate from external scrofula came under our notice in July, 1863. Mr. H., aged forty-three years, a gentleman of good constitution, of the sanguine temperament, and with no apparent predisposition to scrofulous affections, contracted the disease which manifested itself at the anterior base of the *uvula*. The disease neglected, it ran into the suppurative stage before any remedial agencies were used to effect a cure, and the loss of the uvula with a portion of the adjacent soft palate was the result of the neglect. A cure was effected, but the loss of the tissues involved produced a very unsightly aperture through the soft palate about three-quarters of an inch in diameter, which aperture, communicating with the foramina of the nostrils, proved very troublesome to the patient in swallowing fluids and also in the articulation of words.

The condition of the borders of the opening indicated that a healthy granulation was going on. To aid nature's efforts at reproduction, and for the comfort of the patient, we secured a correct impression of the hard and soft palate and adapted a plate to cover neatly the opening, which the patient wore for about two months, happy to find the aperture entirely closed.

WESTMINSTER, MD., January 1, 1864.

PROCEEDINGS OF DENTAL SOCIETIES.

PROCEEDINGS OF THE ODONTOGRAPHIC SOCIETY OF PENNSYLVANIA.

REPORTED FOR THE DENTAL COSMOS BY G. W. ELLIS, M.D.

THE regular monthly meeting was held on Tuesday evening, January 5th, 1864, at 8 o'clock, in the rooms of the Philadelphia Dental College, Dr. Kingsbury in the Chair.

The minutes of the previous meeting read and accepted.

The Executive Committee presented the following report, and, upon separate ballot, each gentleman therein mentioned was unanimously elected.

Active Member—Dr. A. B. Robbins, Meadville, Pa. *Corresponding Members*—Dr. Amos Westcott, Syracuse, N. Y.; Dr. Wm. Cahoon, Detroit, Mich.; Prof. James Taylor, Cincinnati, Ohio. *Honorary Members*—Dr. Geo. J. Ziegler, Philadelphia, Pa.; Dr. J. F. B. Flagg, Burlington, N. J.; Dr. R. Shelton Mackenzie, Philadelphia, Pa.

A letter was read from Dr. Ab. Robertson, of Wheeling, Western Virginia, donating to the library of the Society a copy of his valuable work on *Extracting Teeth.*

Prof. Morton also presented 34 numbers of *Silliman's Journal of American Science.*

On motion, a vote of thanks was tendered to these gentlemen.

Dr. McQuillen said that he regretted to announce the death of their fellow-member, Dr. H. Leibert, of Norristown, who took a warm interest in the establishment and prosperity of this Society. Although not much known to the profession, he was a gentleman possessed of excellent abilities, and when a student attracted the attention of the speaker by his uniformly studious habit and gentlemanly deportment. He had devoted several years to the study of chemistry in particular, and it was while engaged in making some experiments in the manufacture of gunpowder, endeavoring to improve, no doubt, upon a compound for which he had obtained a patent, that he met with his death by an explosion. An event such as this called for some action on the part of the Society expressive of the manner in which the members viewed the loss sustained.

Drs. McQuillen, Morton, and Ellis were appointed a committee to draft resolutions which should embody the feelings of the Society relative to the death of their esteemed member, Dr. Leibert.

The following paper was then read, and illustrated by a number of interesting experiments:—

"PHYSIOLOGICAL RELATIONS OF PHOSPHORUS."

BY HENRY MORTON, A.M.,

PROF. OF CHEMISTRY IN THE PHILADELPHIA DENTAL COLLEGE.

If we were required to say, from a general inspection of their properties, which of the elements was least likely to occur in a living, organized body, I think we should not fail to accord this distinction to phosphorus. More poisonous than arsenic, more readily ignited than any other element, bringing corruption into the flesh and decay into the bones of those who often handle it, we might well conclude that the very last substance which could be admitted into the delicate fabric of a living body, was this incendiary, ever ready to fire life's habitation—this poisoner, ever prompt

to slay the spirit dwelling within. Yet this natural conclusion would be utterly false. Phosphorus not only *is found* in organized bodies, but it *abounds* in them. It occurs in almost every part, and especially in the most delicate organs—resides chiefly in the higher orders of animals, and there presents itself in greatest profusion in the brain, and is so important to the well-being of this part that its deficiency implies idiocy, its abundance intellect.

Should we then conclude that nature here violates her general law of using for each work the most fit material? Or rather look further into the properties of phosphorus and the requirements of a living creature, and, by enlarging our knowledge of both, teach ourselves perhaps at last that here, as elsewhere, nature's means have to her ends the closest possible relation of sufficiency and fitness?

This last course we shall pursue, and, in following it out, we shall first inquire what distinguishes an organized being; then, what sort of powers are required in the particles of which such a one is composed; then, how far this substance—phosphorus—fulfills these requirements; and lastly, if any other resembles it, and how far.

We all know that an organized being is distinguished by the possession of a force, which is not heat, nor light, nor electricity, nor gravitation, nor any other of the physical forces, however closely it may be related to some of them—and we call this force "life." But here our knowledge almost ends. This life-spirit is the most timid of all the forces. We can capture and imprison the sunbeam in the meshes of the collodion film*—we can shut up the lightning in the Leyden phial†—but when, with the scalpel of the anatomist, we seek to break into the palace of "life" and seize upon its inmate, she flies before us, from tapestried chamber to crimson-lined gallery, and as we follow, still retreats, from room to room, until at last, when we have driven her to her last resort, and hope to make a sure discovery and capture, we find but a soundless, uninhabited, and empty vault—the object of our search has perished or is fled. The life-spirit, like the echo, answers harmoniously, though obscurely, to our *distant* questions, but is mute at our approach. Like the sensitive plant, she shuns the human hand, or like the nautilus, sinks when we draw near, down from the breezy sunlight of life into the dark ocean of death, far beyond our sounding. We must content ourselves, therefore, with only a general knowledge of this life-force, obtained by an observation of the works which she accomplishes.

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* In the dry plate process the actinic force *seems* at least not to be converted into chemical action until the developer is applied. So also in the other examples of "bottled light."

† Andrew Cross was accustomed to charge his batteries of Leyden jars during a thunder storm with the *lightning* brought into his laboratory by the system of wires running over his estate, and then use the fluid for experiments of deflagration, etc.

Taking the simplest case of vital action in the growth of a cell, we find two processes in constant and simultaneous operation: one of assimilation and conversion, by which foreign matter is absorbed and applied to the growth of the cell or its embryo progeny; the other of disintegration or decay, by which the cell gives back to the outer world part of the material it had absorbed, and which is the necessary result, or rather, we might say, the supporting cause of the former action, since it is by the destruction and expenditure of force leading to this decay that the first action is accomplished. Both of these actions are necessary to the continuance of "life." No vital function, no act of assimilation or growth can go on without its corresponding expenditure and death, and just in proportion to the amount and energy of the manifestations of life will be the extent of this destruction and death.

What is thus true of the simple cell is true of the most elaborately organized creature, whose body is, after all, only a vast aggregation of cells. As you know, in the growth of the human being, cell buds out or bursts out from cell, (varying in character in various parts, but each alike in its history,) and so builds up the body. Thus it is that the coral island grows, the little insect-like cells budding out upon each other until the complete creature—for so we may fairly consider it—stands a beautiful embodiment of its name—*κορη*, girl, *ἁλιος*, of the sea—a sea nymph resting her white feet upon the yellow ocean bed, and wreathing her brow with sea-shells and twining weeds. And so it is with the more curiously constructed body, in which also there must be a constant death as well as an ever-recurring birth. The heart makes no beat which is not the death-stroke of some of its particles—no limb moves but a portion of its muscle dies—no thought passes through the brain that does not bear a death-warrant to some particle of its structure. Not only do we "die daily," but hourly, moment by moment, in part at least of our structure; and, strangest of all, we *must* so *die* in order to *live*, for the life-action consists in nothing but this—the constant and constantaneous processes of construction and disintegration. So long as the first predominates, life reigns; when the latter process becomes the more rapid, life vanishes. Having taken this general view of the characteristics of an organized body, let us observe a little more closely the way in which this action of birth and death is conducted.

The nutrition of the cell is the result of a chemical union between inorganic atoms, brought about through the agency of the vital force; the reversal of this, or the solution of this chemical union, constitutes the action of disintegration or decay. The liberated atoms may, and often do, form new combinations among themselves; but this is aside from our present subject, having no connection with the organizing power. To accomplish such actions it is clearly desirable that there should be among the atoms employed some possessed of a power of change, as regards their

chemical affinities, a capacity at one time of strongly attracting, and at another of easily abandoning other substances: of seizing upon foreign matter to supply their growth, and of yielding it in course of their partial or ultimate decay.

Passing now to the particular case of the animal system, we find one of its most important constituents to be its circulating fluid or blood, in which, no less by modern discovery than by inspired teaching, are we led to look especially for the mystic life. Let us see what this fluid is called upon to do, and so, what sort of material it may require for its work. This blood is, first, to nourish and support all parts of the complex fabric. It is to carry to the exhausted muscle, material for its renewal; to the bone, solid stone blocks, for building and for repair; to it the throat (that lute, whose strings are always being worn out and replaced, yet are never out of tune) looks for its new cords; to it the eye looks for new lenses, and the ear for new fittings for those shell-like chambers in which the nymph of harmony conceals herself. On its crimson tide float ever whole navies of laden argosies, filled with the most various commodities. Food for all tissues, supplies for all organs, materials for all structures, form their various freight. Nor is this duty all. This same current must not only be the bearer of food and raiment to the inhabitants of its shores, but it must also be like the Ganges, their burial-place. It must carry off the dead bodies of those cells which, having done their work, have by and in that very act terminated their existence. As has been beautifully said in this connection: "It must be at once like a fertilizing Nile, strewing life along its shores; and like that same river, when stricken by the rod of Moses, a bloody river of death, hurrying off the carcasses of its dead inhabitants to the sea."

To meet these requirements, as before, we here again need particles of wide, various, and varying affinities; and also, if it may be, some which shall be able to change, from time to time, their own characteristics, so as to present themselves in an agreeable form to many of those organs, which are so greedy each of its own peculiar condiment, so indifferent to that of all others.

Looking at the structure and maintenance of each other part, we see the same demands repeated: from the solid bones, which yet, for all their solidity, are always needing and receiving repair, to the fragile brain, which a touch would destroy, which every thought in part annihilates, and which yet builds fabrics which will outlast the pyramids, the earth, and all but eternity itself.

In all there is the same demand for a material which shall possess powerful and far-reaching affinities; which shall be capable of exciting in two precisely opposite states, as regards these affinities—now hating what it before loved, now abandoning what it before seized, now clinging to what it before rejected; and for one which, by its capacity of more

than fabled metamorphosis, may fit itself to the various desires of a hundred strange and eccentric palates.

These being the demands of a material which is to constitute an organized being, let us now see if phosphorus fulfills them.

Has it powerful affinities for a large class of substances? This we can answer by experiment. You know that, as a general rule, substances do not combine in the solid state without intimate mixture; yet so powerful is the affinity of phosphorus to iodine, for example, that even in the solid state, in large lumps, they will combine vigorously, as here, where I throw these fragments of iodine upon this piece of phosphorus, and their combination is so vigorous as to end in combustion.

Here again, observe the dazzling light which accompanies the union of phosphorus with oxygen, and which bears witness to the energy of their affinity. So also is it with all the elements which resemble these, the electro-negative class; phosphorus unites with them all: nor only with these; in like manner with the very opposite class, the electro-positive elements, such as hydrogen and the metals. Thus, if I throw into this glass of water these fragments of phosphide of calcium, the phosphorus of the compound will combine with the hydrogen of the water, forming the gas phosphuretted hydrogen, which you recognize by the fact that each bubble as it rises to the surface bursts into flame spontaneously, with the production of a beautiful wreath-like cloud of smoke. Phosphorus, also, as has been said, combines with the metals. We have its compounds with aluminum, calcium, magnesium, lithium, iron, cobalt, tungsten, manganese, copper, lead, and many others, and in time shall probably find that it combines with every element.

We may then most confidently assert that phosphorus fulfills the first of the required conditions, or has powerful and widely extending affinities.

But does it fulfill the second condition, of existing in two opposite states as regards these affinities—one active, the other passive; one of acquisition, the other of abandonment? This question, also, I can answer by experiment. The properties of phosphorus in its ordinary (which is its active) condition are already familiar to you. You know how it fumes and glows in the air; how the least friction, or a little warmth, ignites it; how it is a poison fatal in doses of a couple of grains. Here, however, is a piece of pure phosphorus which does *not* fume or glow in the air; may be *powdered* without igniting; will not take fire until heated to 570°, and has been swallowed in doses of two *ounces* without the remotest ill effect. Its affinities, following them out in detail, are just what this general summary would indicate—feeble, undemonstrative; it combines not at all, or slowly and reluctantly. Yet this is simple and pure phosphorus, and may be converted into the ordinary variety by simply heating it above 570° in some non-combining gas. It is formed by heating ordinary phosphorus for 40 hours to 464°–482°, in a non-

combining gas, by the action of iodine on melted phosphorus, and by the continued action of light on the common form of this element. Here then again our question is affirmatively answered, and we see that this substance is capable of two opposite states with respect to its numerous chemical affinities.

In the next place, then, we ask: Is this body capable of great and numerous modifications of form?

Let me again answer this by practical illustration. Here I have a piece of freshly prepared phosphorus of the common form; it is, as you observe, transparent, of a faint yellow-brown color, very much like a piece of dirty glass, with no crystalline structure. Here again is another piece, opaque and white, like white wax; this, however, is also pure phosphorus. Here again is a piece, opaque and black, like plumbago; this also is the same body, pure and uncombined. Here again I have a mass of regular crystals, here a crimson powder, here a metallic lump; each and all being simply phosphorus, and phosphorus alone. Looking at these so different forms, may we not well say that phosphorus is able to change itself to meet the various requirements of many different organs?

Nor does phosphorus in its uncombined condition only exhibit these properties. Its most important compound, phosphoric acid, is similarly well suited to the changing wants of a changing structure. Thus it is capable of three forms. It may be monobasic, combining with and being neutralized by one equivalent of base; or it may be bybasic, requiring two equivalents of base to neutralize it; or it may be tribasic. Thus in the blood of a young growing animal it might, in its last form, take up three equivalents of lime from the nutritive apparatus, convey these to the bones, there deposit two equivalents where they were needed, and return; yet completely neutralized and deprived of all acid properties (which might seriously injure that fluid) through the circulation, with only one part of the earthy base. This acid is also at once the most powerful and the mildest of acids. It can wring from the fierce oil of vitriol and the violent aqua-fortis, the water which they so long for, and so thirstily swallow; and yet it may be spread upon the skin without injury. When thrown into water, it at first hisses like hot iron, with the vigor of its combination; but then, when it has been reduced to the condition of half melted snow, it very slowly dissolves. As the author before quoted has said: "It is like a feverish child that begs for a great big bowl of water, and then just moistens its lips." In fact, this is the very acid of acids for an organized structure.

We may now, I think, admit that phosphorus, in no small degree, fills the demands expressed by organized structures, as regards their elementary materials; and our last question only remains to be answered, *i.e.* What other element resembles it, and how far?

The element, beyond question, most closely allied to phosphorus is arsenic. The chemical properties of these substances are indeed wonderfully alike, and many of their compounds are hard to distinguish. The affinities of both have a very wide range, and run in the same direction. They are both poisons, and nearly equal in degree. Both are irritants; both in medicinal doses are stimulants; both form garlicky gaseous compounds with hydrogen; both form acids of three forms, not to mention other points of general and special analogy. But with all this resemblance there is one great point of difference; a point of vital importance in the present connection. Arsenic *has no amorphous form.* It is no fierce lion, terrible in its native ferocity, yet capable of being tamed, and even domesticated; but is rather a cruel snake, deaf to all charms, fatal to any bosom that may harbor it. Thus it is evidently unfitted for such an office as that of phosphorus in the animal economy; and being able to exist only in its active form, can perform only active functions in the organism, and being unable to lie there in a quiescent state, must do some mischief to the structure if introduced in any but minute portions. It has been stated (and in popular works the statement has received extensive circulation) that arsenic may by continuous use become a harmless, or even beneficial element in the human system. Such a statement is, however, without satisfactory circumstantial foundation; and utterly without support of experiment and observation. The history of this curious error is as follows. In 1854 a certain Dr. Von Tschudi published, in the *Journal de Chimie Médicale*, an account of an alleged habit of eating arsenic, indulged in by the peasants of Styria and Hungary. The poison was stated to be taken in gradually increasing doses, varying from part of a grain to two or three grains, every few days. It was resorted to by the women to improve their complexions, and by the men to increase their strength. Many strange and pathetic stories, generally without date or location, were added; and it was explained how at last the arsenic-eater must reach a point when to pause, retreat, or advance was alike fatal, for the practice, once established, was a necessity, to abandon it being the occasion of death, with all the symptoms of arsenic poisoning; which, however, did not appear if the dose were regularly taken and regularly increased, ("being graduated according to *the phases of the moon*,") until an amount was reached which must prove a poisonous dose even to an arsenic-eater.

Publicity and authority was first given to this wonderful statement by Prof. Johnston, in his Chemistry of Common Life, and from thence it has journeyed far and wide in popular literature.

To most of our readers the "moon phase" of the proposition (Tschudi's own expression) would, we imagine, be conclusive as regards the value of the whole statement. But we may add, that extended medical observation and experiment have proved that the systems of the inhabitants

of England and America, so far from accustoming themselves to large doses of arsenic by a gradual increase, become, on the contrary, more and more sensitive to the same, or a diminished dose; so that in medical use the full dose, one-eighth of a grain, should be given at first, and then *decreased* if continued.

There is, moreover, reason to suspect that the substance seen in use by Tschudi, if any, was oxide of zinc. The question was revived a few years since, in a lecture delivered in one of the London hospitals, where the lecturer brought forward some letters from a superintendent of mines, and others in Germany, alleging the existence of the practice; but here the evidence proved too much if admitted, for it was distinctly stated that the first dose recommended and taken to begin the progress was of three grains, *a full fatal dose*, in this part of the world at least.

We see, then, that in answer to the demands made by organized structures, phosphorus presents an array of properties wonderfully adapted to such requirements; and that it alone, of all the elements, possesses at once all these needful powers. Seeing, moreover, how large a use is made of this substance in organized creatures, it must be very evident to us that here, as elsewhere in the great workshop of nature, the material employed is the best adapted, as is the tool used the most efficient, for the structure to be produced.

Dr. McQuillen said that, in connection with the admirable paper just read, he would direct attention to the fact that according to Liebig the acidity of *urine* is due to the presence of the acid phosphates in that secretion. Some of these phosphates are derived directly from the food—animal and vegetable—but a very large proportion is due to the decomposition of the osseous and other tissues, especially the brain and nervous system generally. The phosphorus derived from the latter source is supposed to unite with oxygen and then combine with bases.

The quantity of phosphates present is liable to considerable variation, and it is well known that any unusual demand upon the nervous system, such as undue exercise of the mind, and all circumstances producing nervous exhaustion, is accompanied by a marked increase. Even in the normal action of the brain attendant upon an unusual but not exhaustive mental effort, the wear and tear of nerve tissue is made manifest by the additional amount of phosphorus in the urine; the most conclusive evidence of the truth of this is afforded by clergymen, with whom the periodical demand upon the mental powers in the preparation for and discharge of their clerical duties is followed by such results.

His principal object in rising, however, was in relation to the pathological rather than the physiological effects of phosphorus on the human economy. He referred to that peculiar and destructive disease known as *phosphor-necrosis*, in which the maxillæ of operatives employed in the manufacture of lucifer matches are liable to be affected by the action of

phosphorus to such an extent as not only to induce necrosis and exfoliation of the bones, but also to result, in some instances, in the death of the patient.

Several years ago the subject engaged considerable attention in Germany and England, where quite a number of cases were reported. Very few cases have occurred in this country, or at least have been reported in the medical journals. One of these, in which the inferior maxilla was removed by Dr. Halsey, had come under his notice.

There are several stages in the manufacture of the matches, some of which are harmless; but all those involving the presence of phosphorus are regarded as more or less *dangerous to persons who have carious teeth. No case, however, has been reported in which those possessing perfectly sound teeth have been attacked by the disease.*

The affection manifests itself first by pain limited to a carious tooth, which eventually extends to the whole jaw, and over the cheek, temporal region, and neck. This is accompanied by swelling of the gums and cheek, with erysipelatous redness of the latter; an abscess soon forms, and discharges fetid pus into the oral cavity, or it may open upon the cheek and discharge externally; a sinus being established, the livid gums retract from the jaw, and the teeth become loose and fall out; the disease progressing, more sinuses form, through which the necrosed bone can be reached by the probe. The affection may terminate in exfoliation, or extend and involve the soft parts, until death terminates the scene.

From carefully recorded statistics it appears that the liability of the inferior maxilla to the disease is greater than the superior. And a marked peculiarity of the disease is that the alveolar process, body, and rami of the necrosed lower jaw are invariably more or less invested by a morbid product, increasing in thickness from above downward. In the upper jaw no new substance appears to be deposited.

When the disease obtains much headway, there is very little if any chance of saving the affected bone. Such being the case, it is important that attention should be paid to prophylactic or preventive measures. Care should be exercised on the part of the manufacturer to see that the teeth of those in his employ are either perfectly sound, or that all those affected by caries are placed in a proper condition by the dentist.

It is generally supposed that the *phosphoric fumes* present in some departments of the manufactory, the drying-room in particular, are the active agents in developing the affection, and this view appears to be confirmed by experiments performed by Dr. von Bibra on rabbits, which were exposed to the fumes of phosphorus in a wooden box after the jaws had been fractured in the effort to extract the molar teeth. The animals lived about eight weeks, and on a post-mortem examination the jaws were found in a condition somewhat analogous to that presented by the jaws of persons who have suffered from phosphor-necrosis.

Prof. Morton stated that certain factories in England had employed amorphous phosphorus for the manufacture of "the patent safety match;" these, however, have not come into general use, since they can be ignited only by striking them upon a peculiar paper made for the purpose.

Dr. Flagg said that he believed it was not alone in the drying rooms of match factories that danger of excitation to phosphor-necrosis was incurred, but in every department of this or any other establishment which exposed the manipulator to the fumes of phosphorus or to actual contact between the material itself and the *maxillary* periosteum. He knew nothing in relation to this matter as the result of his own experience in practice or by experimentation, but communications upon this subject seemed to indicate it as of especial interest to the dentist, in that the maxillæ *alone* were selected as the location for manifestations of disease. He had *seen it stated* that even when fistulæ existed communicating with periosteum in other portions of the economy, the contiguous osseous structure seemed exempt from contamination. Thought that while the connection of phosphorus with investigations in this direction was deeply interesting, yet it was more so theoretically than practically, for the predisposing causes were so well understood that such preventive measures had been instituted in the matter of dental examinations, etc. as had almost entirely precluded the possibility of the occurrence of this terrible affection. He called to mind the peculiar recuperative energy which the periosteum usually exhibited after the performance of that enucleation of devitalized bone which was regarded as the proper operation in phosphor-necrosis, and which therefore called for the utmost care in its preservation at the hands of the operator. He would refer briefly to the connection, in the matter of teeth, odors, etc., which had been alluded to in the paper for the evening, between phosphorus and arsenious acid, and would notice the similarity which also existed in their action when induced locally or constitutionally, in the former as extensively destructive of vitality, and in the latter as extensively productive of invigorating influences. He would mention the free administration of carbonate of magnesia in water as the antidote to the effects of swallowing phosphorus. He desired at this time to repeat that which he believed he had alluded to upon the floor of this Society at some previous meeting, but which seemed to have an immediate connection with the subject under consideration, and to possess sufficient practical importance to warrant its presentation; he had reference to the exhibition of phosphatic salts during the periods of infantile and second dentition. He had frequently been instrumental in producing much alleviation from irritation and restoring the necessary vigor to systems which seemed incapable of otherwise supporting the febrile exhaustion concomitant with the process of first and second teething, by the use of the phosphates of iron, lime, manganese, potash, etc. combined with such stimulants or sedatives as seemed individually indicated.

Dr. McQuillen said he doubted very much the accuracy of the opinion that phosphorus has a decided affinity for the maxillæ in preference to the other bones of the body. It is owing to the fact that the agent is brought *directly in contact with the periosteum of the maxillæ* by carious teeth that the disease is developed, and it is reasonable to infer that under similar circumstances other bones would become affected. Two or three years ago he was on the eve of instituting a series of experiments on animals to determine this point, but permitted the opportunity to pass by without making the attempt.

Dr. Kingsbury remarked that he had listened with deep interest to the essay of Professor Morton, also to the discussion elicited. The subject, in its relations to our specialty, commended itself to our consideration, and was well worthy of the most careful and thorough investigation of every dental practitioner. Although it was in some of its aspects a highly *luminous* subject—as had been clearly demonstrated by the numerous and beautiful experiments of the evening—it must be conceded that in other respects it was involved in mystery and darkness. He referred to the various and contradictory opinions entertained by pathologists in regard to the action of this subtle and powerful agent in producing what is known as phosphor-necrosis, and the difficulty experienced in satisfactorily explaining the rationale of its specific effects.

That most useful invention—the lucifer match—has revealed to us the singular and destructive influence of the fumes of phosphorus. As had been already stated, the attention of European physicians was first called to this subject, yet he remembered to have read an interesting account published in the *New York Journal of Medicine* for May, 1856, by Dr. J. R. Wood, in which he gave the history of a case of this species of necrosis, where he removed the entire inferior maxillary bone for the cure of the disease. That was the first case brought to the notice of the medical and dental profession in this country. A number of cases occurring in the match factories of this country had been reported, he believed, since that. Whether the destructive effects of phosphorus were due to the fumes coming in direct contact with the periosteum, or alveolar process, or to its absorption into the system, and thus acting constitutionally in the same way as mercury, was a question difficult to solve. Perhaps it acted both locally and constitutionally. There were strong reasons to believe such was the case. Dr. von Bibra attributed its injurious effects to the hypophosphorous acid produced by the oxidation of the vapor of the phosphorus. In whatever manner the specific effects were produced, inflammation of the periosteal membrane was followed by its destruction and sloughing, and necrosis of the bone was the inevitable result. Proper prophylactic measures would no doubt do much to avert the dire consequences to the workmen engaged in the manufacture of lucifer and congreve matches. The Austrian government requires the employees of the

lucifer match factories to wash their mouths frequently with acidulated water. In an extensive factory of congreve matches in London, the workmen wear sponges before their mouths, and use a solution of soda for washing their hands. The proprietor states that since the adoption of these preventive measures, in connection with thorough ventilation, not a single case of phosphor-necrosis has occurred among his workmen. If regulations so simple proved to be such an effectual safeguard, he hoped for the cause of humanity that they would be speedily adopted, and faithfully enforced in all similar establishments.

Dr. Ellis said that the physiological properties of phosphorus had been thoroughly considered in the interesting paper just read, and the remarks subsequently made had embraced the main points in relation to its therapeutic powers, and its influence in producing the disease known as phosphor-necrosis. He remarked that the treatment of this affection had not been noticed, and as it is now, in connection with all other affections of the mouth, jaws, and their appendages, claimed by and accorded to the dental practitioner, it behooves us to be familiar with its peculiarities. He knew that cases of extensive syphilitic necrosis had been successfully treated by the dentist, but whether a case of phosphor-necrosis had ever fallen into the hands of a member of our specialty, he was unable to say. The surgical treatment of phosphor-necrosis was the treatment of necrosis from whatever cause or causes it may arise; and in connection with the subject, there has arisen much argument relative to the bone-reproducing function of the periosteum, some contending that to that membrane alone are we to look for secondary osseous formation, while others believe all tissues capable of effusing a plasm susceptible of osseous organization. It may be that both are right, and that both sources contribute toward such a result. Prof. Gross, in his work on surgery, regards the question as unsettled, and states, as the result of personal observation, "that the perfection of the new bone will generally be found to be in proportion to the integrity and activity of the periosteum." Dr. Atkinson, of New York, who has had considerable experience in the treatment of necrosis of the jaws, advocates the retention of the periosteum, so far as practicable, when the removal of bone is necessitated, in order that it may act as a pouch to retain the plasm, and insure its organization in a form closely approximating the natural contour.

At the close of the discussion, Dr. Tees presented, for examination, Dr. Henry's improved vulcanizing flask, designed to allow the surplus matter exit without endangering fracture of the blocks.

Drs. Flagg, Gorges, and Tees were appointed a committee to examine and report upon its merits.

Dr. Haywood exhibited his improved manner of securing blocks to vulcanite base.

Upon motion, adjourned.

PENNSYLVANIA ASSOCIATION OF DENTAL SURGEONS.

REPORTED FOR THE DENTAL COSMOS BY JAMES TRUMAN, D.D.S.

A MONTHLY meeting of the Association was held on Tuesday evening, January 14th.

The subject for the evening's discussion, "Hard Rubber, its Properties and Adaptability to the Mouth," was opened by Dr. Buckingham, who said, at a former discussion of this subject it was asserted that hard rubber contained free mercury; and one speaker went so far as to say "he had examined many specimens of unvulcanized rubber, and had yet to see the first piece that had not the little globules plainly discernible, either with the naked eye, or with a glass of low magnifying power." Since that time Dr. B. had examined a large number of specimens of unvulcanized rubber for free mercury, and in only one had he been able to detect the least sign of it, and that was a very imperfect sheet. He had not seen one like it since. It was filled with dark spots, as though charcoal had been mixed with it, and in one of these spots he had detected a few globules of mercury. The sheet of rubber was not fit for use, even had there been no mercury present. He had tried it by pressing between the thumb and fingers, twisting it in the hands, and by pressure in a large vice, and in no case, except the one mentioned above, could globules be forced out of it. He had sealed it up with gold foil in a glass tube, and vulcanized it without any effect of mercury on the gold. Dr. Wildman had shown him some tests, where the vulcanizing had been done in glass tubes, bent at right angles, so that the ends of the tubes were kept cool during the process, and not the least trace of mercury came over. The glass tubes were placed in a vessel containing oil or paraffine, either of which will bear heat enough to vulcanize rubber in an open vessel.

When some specimens of vulcanized rubber are burnished, small spots may be detected with a good glass, which have a metallic appearance; but when a number of these are collected together, they do not present any of the properties of mercury. He supposed there was some metallic substance—probably oxide of tin—mixed with rubber to give it body.

Dr. H. Townsend said he had used rubber for five years, and preferred it to any of the metals. It was lighter, and more easily kept clean. He had found that the surface of the rubber would become coated with a deposit from the secretions of the mouth, which is removed with difficulty. To prevent this collection, he recommended his patients, after washing with soap and water, to wipe the piece carefully with a napkin. This not only keeps the surface clean, but improves the finish.

He considered it far superior to metal for regulating plates; and the ease with which its shape can be changed by heat, rendered it very valuable for impression cups. He thought many improvements would yet be made in getting up this kind of work.

Dr. Barker considered rubber as one of the most valuable adjuncts to the profession. Where economy was an object, it was a great saving in many respects. In a case that recently presented in his practice, where a gold plate had lost its adaptation, he remedied it by taking an impression of the mouth, cutting numerous holes in the gold plate, and then vulcanizing a thin coating of rubber on the palatine surface. By this means restored the usefulness of the denture, with very great saving to the pocket of his patient, with whom expense was a great consideration. Instead of soldering backstays in the usual manner, he recommended the use of rubber to fasten the teeth in position. The plan was to run a narrow strip of gold back of the teeth, catching it at intervals with solder, then pack the rubber between this and the teeth, and vulcanize.

In his judgment, rubber was often injured by over-heating, and preferred to follow Dr. Hay's instructions; run the heat up to 240°, and continue to raise it very slowly, until it reaches 320°, when the heat is discontinued. By this mode the color is improved, and the rubber is more pliable and elastic. It was Dr. Hay's opinion, that the color was injured by continued heat at a high degree. Dr. B. thought the rubber now in use was very inferior to that formerly manufactured. This was particularly noticeable in the color, which is much darker than that obtained from rubber prepared two or three years ago.

When plain teeth are used, and it is necessary to set them directly upon the cast, he did not think it advisable to allow the teeth to remain in the female model, but preferred to keep them on the original cast, and run plaster around them in that position, then pack the rubber on the male model, instead of the female, in the ordinary way. The advantage of the above method was in having the teeth properly fitted in position on the cast, which would not be the case if the flask should not happen to come closely together.

Many dentists, in preparing their gutta-percha or wax plates, make them thick and clumsy, requiring much time to finish up the duplicate after vulcanizing. The more care that is extended to the wax or gutta-percha plate, the less finishing will the vulcanized plate require. Seldom found it necessary to devote more than a half or three-quarters of an hour in finishing and polishing rubber work.

Hard rubber is easily softened by immersion in boiling oil. To do this safely and successfully, it is necessary to test with rubber before placing the set of teeth in it. A moment or two will be sufficient to soften, when it can be pressed down on the cast to the shape desired;—was indebted to Dr. Wildman for this suggestion. In answer to a question of Dr. Bailey, whether Dr. B. recommended the plan of backstaying teeth to any particular class, the doctor replied that any kind of teeth could be used; single teeth could be backstayed by this mode with as much facility as blocks.

The force used in bringing the flasks together was generally far too

great. He places his flask in a kettle of boiling water for half an hour, when it will come together with slight force.

He rubs his plaster, before vulcanizing, with a piece of muslin, which serves to give it a high polish, and facilitates the finishing very much.

Dr. H. Townsend was formerly in the habit of placing a thin coating of rubber on gold plates, in the mode described by Dr. Barker; but now preferred to cut out the plate close to the backings, before adding the rubber.

Dr. Buckingham had seen a plan recommended very highly, of striking up a gold wire gauze, and imbedding it in the rubber, to prevent the rubber from breaking when it was made very thin. Had not tried it, but had no doubt but that it would answer. Some of his rubber plates had broken through the centre; but by imbedding a strip of gold or platina in the rubber close to the teeth, the liability of breakage was in great measure avoided.

Had adopted the mode of filling the interstices, under blocks, with rubber. Very few blocks are fitted to the plate perfectly, and frequently large spaces are left between them. Formerly these spaces were filled with gutta-percha or some other substance. He thought rubber was the best that could be used for this purpose.

The accumulations on the rubber from the secretions of the mouth, mentioned by Dr. Townsend, were not confined to it alone. Had found the same on gold plates, when they were not removed and cleansed frequently. In cleaning a rubber plate, all that was necessary was to use a brush, soap, and water.

He generally uses wax as a base in putting up this kind of work, and prefers it to gutta-percha. When the teeth are to be tried in the mouth before they are mounted permanently, the latter is the best material, as the teeth do not separate from it as easily as they do from wax. To remove the gutta-percha, after the case has been imbedded in plaster, he puts the flasks in water at about 120° of heat. At this point, the gutta-percha is softened, so that it can be removed very easily. Wax can be removed better when it is cold, unless in places difficult to get at. From these places it may be washed out by pouring in boiling water. He had noticed when wax had been left in, it combined with the rubber in vulcanizing and rendered it soft.

To prepare wax for this purpose, he took ordinary wax as prepared for taking impressions, softened it by holding near the fire, and then rolling it out with a rolling-pin. If the rolling-pin and table are wet with cold water, the wax will not adhere to them when it is being rolled.

The most effectual instrument he had met with to finish rubber work was made from a common three-square file. The temper of this was drawn, filed smooth, and then bent on one of the angles, so that it would have a flat side on the outside of the curve. It was then retempered and ground up to an edge. This gave two cutting edges, that could be

used either to the right or left. He formerly had a student who used glass for scraping rubber, and where the surface is such as to allow it to be used, he knew of nothing superior to it for that purpose. He found no fault with rubber as a material, but the thickness was sometimes objectionable. He had inserted temporary teeth on it immediately after extracting the teeth. He allowed the former to run up on the natural gum, as they would have done had they been mounted on a metallic base. He considered it better to take the impression immediately after extracting the teeth, than to wait for a day or two, when the swollen condition of the gums would render the mouth unfit for the insertion of a plate.

Dr. Barker considered the repairing of teeth with rubber as an exceedingly valuable improvement. Old block work, fastened to the plate by rivets, he had found especially annoying, as it involved considerable risk to repair them in the usual way. With rubber, this difficulty is obviated, making them perfectly firm, without risk to the teeth. If possible, bend the plate slightly at the edges and heat it moderately, then pack the rubber in every point possible, and vulcanize. This plan has the advantage of keeping the piece more cleanly than as originally secured.

For irregularity plates, the doctor considered rubber invaluable. When it is desired to bring out the superior incisors, situated posteriorly to the inferior incisors, the usual mode is, or was, to strike up a plate with an inclined plate attached, that would probably be removed by the patient whenever it became an annoyance, or the teeth a little sore. In place of this, he takes an impression and makes a rubber plate to cover the molar teeth, and fastens a gold or silver bar to it, to which ligatures can be attached. Such a plate can be worn with comfort. When any prejudice exists against the bar of gold in front of the incisors, has screws attached posteriorly to the teeth, so that they can be regulated by the patient at will.

Dr. Buckingham asked if any one could explain why there was such an unpleasant odor when teeth were removed from a rubber plate, after it had been worn some time. There appeared to be no space between the teeth and rubber to retain offensive matter. There was no unpleasant taste perceptible while they were in the mouth, nor was there any odor until the teeth were heated to remove them from the plate.

He removes the teeth from rubber plates by heating them over the flame of a spirit-lamp or gas, when they are easily separated from the plate, as the rubber becomes very soft when heated.

To finish up this kind of work, Dr. B. uses, after the scraper and file, fine sand-paper, marked "double 00," follows this with cork, on the lathe, pulverized pumice-stone and water. After this, a brush wheel and pumice, and finishes with a buff wheel and prepared chalk. The piece is then washed off with soap and water, and rubbed dry with a napkin.

Dr. W. W. Townsend did not use, in finishing, very fine emory paper; preferred No. 2. This would finish it sufficiently to follow it with felt

buff and pumice-stone. He thought this superior to cork. Twenty minutes' labor was all he required to finish up a case after the use of the emory paper. Always keeps his teeth on the model, as suggested by Dr. Barker. For base plates, prefers wax, which he removes from the flask by the aid of hot water.

Dr. Buckingham thought keeping the teeth on the cast a good plan, but found difficulty in getting the wax out.

It is an important matter to determine the exact quantity of rubber required. His plan was to take twice the weight of wax in rubber. This he had found sufficient in most cases; but in one lot it required three times the weight of the wax to give the desired quantity. When gutta-percha is used, this proportion would not probably answer; but could easily be determined by experiment. An overplus of rubber requires too much force to bring it down. He thought well of Dr. Barker's plan of boiling before bringing it together. In his judgment, a self-acting spring was to be preferred to the screw, to bring it to place. The danger of breaking the teeth by the latter mode was very great, as more force was generally used than was necessary. Always saturates the plaster with water before pouring other plaster upon it.

Dr. Barker said that when the use of rubber was first commenced, had some difficulty; the plate would not fit the mouth after vulcanizing. He had discovered the cause to be removing the case from the flask before it had thoroughly cooled. Plaster is a bad conductor of heat, and requires time to cool perfectly before attempting the removal of the case. He instanced a case, where in endeavoring to remove it too soon, he tore the plate in half.

Dr. Buckingham had found that when rubber came in contact with wax or oil, its texture was materially injured. In answer to a question of Dr. Barker, whether Dr. Wildman had not vulcanized in oil, he said that such was not the fact; he had used oil to heat it in, but the rubber was in glass tubes, so that the oil did not come in contact with it.

Dr. Barker had seen a plan published and recommended, of packing rubber on silver plate; but in his opinion, one trial of this mode will be sufficient for any one. Both the metal and rubber are ruined by the contact. He instanced a case where, in a bad-fitting silver plate, he had thoroughly cleansed the surface with ammonia, then polished and gilded. He then made a wax plate for the under surface, and vulcanized in the usual way. This proved entirely successful.

Dr. H. Townsend thought it important to remove all the wax; but had never been much inconvenienced by it, when he was obliged to allow it to remain. Where it was difficult to remove by ordinary methods, used boiling water. In answer to a question of Dr. Barker, whether he boiled out the entire quantity of wax, said he endeavored to remove the whole of it.

Dr. Fouché remarked that when hard rubber was first introduced to

the profession as a base for artificial teeth, he regarded it with much favor; and has used it largely during the last five years, in nearly all the various modes mentioned in this discussion. Thought he was the first to suggest the use of the double-headed pins; and also the inserting a gold plate in the rubber to prevent fracture of the plate. Has had gold springs inserted to clasp the teeth. He regards rubber as invaluable for the facility it affords in making up the contour of the alveolar ridge, and for its lightness and cleanliness. When properly vulcanized, it is tasteless and inodorous. He has used it in mouths where every other kind of base had been tried, without giving satisfaction; and he still regards it the desideratum as a base for artificial teeth.

On motion of Dr. Buckingham, "The Office and its Fixtures" was selected for discussion at the next monthly meeting.

Adjourned.

ERRATA.—In the December number, page 260, line 23d, after "paraffine and wax," insert the word "was."

On line 24th, after "plastic condition," omit the word "was" and insert the words "and a part of this."

On lines 12th and 13th of the same page correct the *typographical* error "sub-maxillary" by reading "sup. maxillary."

BROOKLYN DENTAL ASSOCIATION.

BY THOS. BURGH, D.D.S.

A MEETING of this Association was held December 10th, 1863, when the following subject was discussed:—

"What Improvements in the Practice of Dentistry have fallen under our observation during the last few years?"

Dr. Ingersoll frequently uses chloroform in excavating sensitive cavities. Finds it especially useful in operating for children. Observes that it usually checks the flow of saliva. Has never seen any unfavorable result from its use. To prevent inhaling it himself, frequently administers it in a small perfume bottle, to which a little perfume is added, and allows patients to take it themselves as they require.

Dr. W. H. Allen has administered chloroform for the same purpose to adults. Gives a few drops on a napkin, and then goes to work. When the effect passes off gives more. Has several patients who always take it when having teeth excavated for filling. While they are under its influence he can excavate to his heart's content, knowing that he is inflicting no pain.

Dr. Atkinson is glad this matter has been tested. Has noticed his life-long that patients usually have just such feelings as they expected

at the time of passing into the unconscious state. This is no mere accident, but is just as much the effect of law as is the rising of the sun. Pain is never a normal condition. It is well known that those who are exhausted complain of pain from contacts, which under other circumstances might be pleasure. Depolarization is the cause of pain in the molecules, while their polarization is but the due quantum and equable flow or presence of electricity. It is not true that there is a plus standard of life. Molecules charged to satiety with life-presence will hold no more. That sthenic and asthenic conditions exist there is no doubt, but they are misapprehended. Sthenic action is but a continued stimulation or tonic impression, and consequently always within the range of pure health. Asthenia is simply the reverse of this, in the degree of its manifestation. Alluded to the difference in result of the treatment of this condition; and expressed a hope that anatomical investigations will yet be prosecuted into the ultimate terminations of the peripheral nerves, so as to demonstrate by coagulation, or other means of "fixation," the exact relation of the mechanism of life acts in the body. The philosophy of Dr. Ingersoll's method is clear to his mind, but has never practiced it. Many agencies act upon the organism as polarizers. Chloroform is one of them. Individuals may be favorably or unfavorably acted upon by our polarizing, or magnetic presence. Where we have the full confidence of the patient we can do as we please, with or without chloroform or other anæsthetic. If our motives are pure, we are sure of effecting our purpose for the good of the patient, by which alone we can get clean money for the services rendered. Believes, with Dr. J. Allen, that the best anæsthetic is a clearly educated head, kind heart, strong but gentle hand, and a determined purpose to effect the best good for the patient.

Our greatest difficulty is, that we have so little settled purpose to do our best to the death. No will at all is what ails us. So soon as we have a will, we shall find a way to become masters of the philosophy and the detour of our professional duties. Has already enunciated the cause of immunity from pain. There is no guess work about it, if we have the open vision of a well-instructed mind. When we doubt and hesitate, we deprive ourselves of the power to manage our cases; and, under such circumstances, refrain from using remedies which may prove disastrous. But when we have confidence, there is much satisfaction in making painless operations.

Dr. Fitch had administered chloroform in one instance, during the excavation of several extremely sensitive teeth, inducing partial anæsthesia with the happiest results. Spoke of its systemic effects, especially its action upon the voluntary system of nerves in suspending their functions during its prevalence. Doubted its power to restore to immediate health sickly molecules, and questioned very much the soundness of the position in explaining its anæsthetic results in this way. Supposed that,

instead of promoting healthy molecular action, it on the other hand arrests it. Chloroform does not seem to act upon the ganglionic system of nerves. It interferes with the action of respiration, by suspending the controlling action of the pneumogastric nerve, by paralyzing its centre in the medulla oblongata.

Understood sthenia to mean a normal or plus condition of all the forces of the organism; that it was generally indicated by a full habit, plethoricity, etc. Asthenia is the opposite of this. Sthenic inflammatory action is inflammation occurring in plethoric subjects, caused by an increase of the vital forces, which increase arises from the presence of some foreign excitant in the system; while asthenic inflammation is that which occurs in a debilitated condition, arising, it may be, from the same primal causes.

Referred to the exalted sensibility of tooth structure, under these different constitutional conditions. Spoke of chemical and vital forces at work upon the structure of the teeth, in accounting for their rapid disintegration under certain circumstances. Sometimes finds the junction of the enamel and dentine exceedingly sensitive. Thinks that nerve substance, in some form, must exist at these points. Minute ganglia are formed at the peripheral extremities of the sensory nerves. This might be the case in dentine, the neural matter being too minute to be detected by any known means.

Dr. Ingersoll would draw from some one the best method of extracting a nerve from the roots of a tooth.

Dr. W. H. Allen recommends Dr. Corydon Palmer's nerve instruments for opening pulp cavities, removing the pulp, and plugging. Thinks them the best, for the purposes named, that he has ever seen. Always had difficulty until he procured a set of these instruments. Always found it difficult to extract a dead pulp at once clean; but does it sometimes. As a general thing, however, they come away piecemeal.

Dr. Fitch endeavors to convert the pulp, before removing it, into a tannate or arsenicate of albumen; and, if successful, which he generally is in healthy constitutions, is enabled to remove it entire by slight traction. If the pulp is not thus removed, and the fang too minute for the passage of a small broach, drills it a short distance, and applies creosote, filling as usual. Generally this treatment is successful.

In case of breaking a broach in a fang, and being unable to remove it, a few dressings of the tincture of iodine will disintegrate it; but has filled fangs, leaving the small piece of steel in them, without any unfavorable results.

Dr. Atkinson.—"One word of explanation in regard to sthenia and asthenia. All vital action is effected, in the corpusculary system, under the control of the peripheral nerves. Burning and freezing are examples of this. Cold is primarily a stimulus, and hence contracts the capillaries,

depriving them of all red corpuscles, and most of the liquor sanguinis;" thus blanding the part before it consolidates or crystallizes.

Sthenia, then, means health; and asthenia, disease or loss of balance between the seen and unseen primates of the organization.

Whether a frozen part is living or dead may admit of some discussion; but that it manifests no symptoms of disease, even when brought back to a normal state of thermal and fluid condition, by the same grade of degrees through which it passed to apparent death and solidity, has often been proved by practical tests.

Dr. Fitch understood anæmia to be a deficiency of blood, either in quantity or quality. It cannot exist any length of time without affecting the general constitution. All nutrition is extra vascular. The capillary vessels being the peripheral terminations of the arteries and the commencement of the veins—or, in other words, a part of the vascular system—nutrition must take place outside of this plexus of blood-vessels. Therefore, in cases of anæmia, he could readily understand how, by exosmosis, nutrition—or, in other words, molecular action—might be seriously interfered with, the nutritious liquid aliment passing out into the general circulation before accomplishing its work of repair, producing marasmosis, or a wasting of the tissue. In normal blood there is a relative specific gravity of the liquor sanguinis and the contents of the blood corpuscles, the liquor sanguinis prossessing the less specific gravity. If this condition is changed, the healthy character of the blood is changed; the blood corpuscles being deprived of their normal liquid contents, by an act denominated "exosmosis." In such cases the nervous force sooner or later suffers, the nerves being deprived of their normal quantum of stimulus derived through the oxygen carried by healthy blood globules. It is found by experiment that a certain amount of nervous force is essential to healthy molecular action. Hence, here are reciprocal influences constantly operating, either favorably or the reverse. Anæmia has reference to a deficiency of blood, which always, to some extent, produces diseased structure; while asthenia refers to a deficiency of nervous force which presides over and attends the most minute physiological act. In cases of anæmia and asthenia, the rapid disintegration of the teeth, at times, demonstrates the prevalence and potency of these pathological conditions; and to arrest decay in such cases, requires decided constitutional treatment.

DELAWARE DENTAL ASSOCIATION.

REPORTED FOR THE DENTAL COSMOS BY S. S. NONES, D.D.S.

THE monthly meeting of the Delaware Dental Association was held on Tuesday evening, January 19th, at eight o'clock. President in the Chair.

The minutes of the last meeting were read and adopted.

Dr. Nones then read letters from Dr. J. Taft, of Cincinnati, and Dr. W. H. Atkinson, New York, expressing a warm interest in the Association.

The essayist for the evening not being present, an interchange of views on different subjects, of a practical nature, took place.

On motion, adjourned.

EDITORIAL

OXY-CHLORIDE OF ZINC.

We have referred to this substance, on several occasions, for filling teeth, more by way of reporting our experience with it than contending for the merits or demerits of the article. It was recommended to us, in the highest terms, by persons who held its component parts and particular method of preparation as secrets; but when it was fairly explained to us by Dr. Metcalf, of New Haven, we gave it a trial and reported accordingly. We remarked at the time that too much was claimed, as a rule, by inventors of new things; hence it was necessary for every one to be patient and wait for the test of time. It is proper and right, perhaps the duty, for every inventor to put his views and productions forth as fast as he can in everything that looks toward benefiting mankind. Allowance must be made for them, as well as for those who take exceptions to extravagant views advanced.

We use the oxy-chloride yet, but do not place as much confidence in it as we supposed we at first could. It wears away by direct contact with the food or brush. It seems to be soluble in the fluids of some mouths, or different specimens differ in quality to wear and solubility. It must be kept dry while using it, which renders it often inapplicable. It washes away when in contact with the margin of the gums. It gives way around the margins of the cavity first in many cases, for reasons which we know not. It does not seem to have any effect on the enamel when in contact with it, as was first supposed, and which was regarded as a fatal objection to it. We have never used it in combination with gold or tin or plastic metallic filling; it complicates matters too much for us, but we do not object to others using it in that manner. We have never seen a case where we thought it was required, as we do not plug teeth in the condition that it is recommended when so used.

It is undoubtedly the duty of every dentist to resort to every means in his power to render good and efficient service to his patient under all circumstances as far as in his power lies, and to the best of his judgment; but it must be admitted that there is a standard of excellence somewhere—a standard of merit to which all should strive to attain. Excellence does not stop with limited capacity, inexperience, or lack of

skill. It is not true, therefore, that if an operator resorts to the use of materials for plugging teeth which do not demand of him skill and hard work for the patient's good, that he has nothing more to attain, and rest satisfied that no one can do any better. The best teeth demand the best material—the best and the highest order of skill. If inferior substances are used in shells of teeth which cannot bear a great amount of labor or force, such as gold requires for excellent operations, then it is justifiable to resort to something else; but when a difficult position of a cavity is urged as a reason why a plastic filling is employed, or badly shaped cavity, there is no excuse except want of skill, and excuse should be placed on that ground, and not that it cannot be done with gold by others who possess superior skill. Appreciation of skill should be cultivated and acknowledged by those who have not attained to the highest excellence. It is not considered a disgrace for one medical practitioner to call upon an older and more experienced practitioner for advice, or for one surgeon to send certain cases to another who has made such cases his special study. If a dentist knows his deficiency, it would be much better for him and the patient to acknowledge it, than put off his patient with an inferior production. If his work fails, it will pass into other hands and permanently count against him.

We have just seen four plugs—a superior right front incisor and canine tooth, an inferior right canine and first bicuspid, labial surfaces—which had been plugged, by an experienced practitioner, three times with oxy-chloride of zinc, three or four years ago; each tooth had been plugged three or four times, but in a short time each filling washed or wore out. The patient complained that in this way the teeth would surely be lost in a short time. The dentist said nothing better could be done and the teeth must go, as gold could not be used to answer as well. The patient applied to us for advice. There was no difficulty in using gold. Three years have elapsed, and the plugs and the teeth are, to all appearances, as good as when first done. We do not state this to praise our own work, as any good operator could have done as well, and we see and do much more difficult work every day or week, but we cite it, and could cite hundreds of cases, to show that a substance that can be introduced at all, was and is constantly done by operators who ought to do better or cease to attempt such cases. It is certainly true that the operator referred to has seen such cases that had been plugged with gold every day.

We scarcely deem it necessary to cite cases where the oxy-chloride may be used without compromising skill or good judgment; but one out of a great number may be admissible.

Mrs. P., a lady twenty years of age, lost the pulp of the right superior front incisor. The walls of the cavity were very thin. It was plugged with gold. The tooth became very blue—quite unsightly. She wished

to get rid of the disfigurement. We removed the gold from the body of the tooth, left the fang plug remain above the margin of the gum, and plugged the tooth with oxy-chloride. No discoloration followed this plugging. In two years after the filling partly washed away. It was refilled, with the same kind of filling, by a dentist in a distant city, but in a few months it washed away. On a visit to this city she applied to us for refilling. No decay had taken place since we first filled it two and a half years ago. The enamel did not show any more signs of deterioration than any other dead tooth. The reason why the second filling did not last, was because no precaution was taken to keep the parts dry while plugging. If, in such a case, the plug has to be renewed every two years, it has the advantage of holding the normal color of the tooth and preserving the crown as long as it can be done to advantage. The patient's teeth are large and apparently of a very open structure. To preserve the body of the tooth as long as possible, so as not to be unsightly, was the reason for using the oxy-chloride, as there was no difficulty in plugging with gold. If it was confined to such cases and some few more, it could not be condemned by any one. Let each substance be confined to such cases as it properly applies to, no matter how limited the extent may be; and do not use a temporary material where a more permanent one can be employed. Circumstances modify the treatment of cases; but do not take anomalies for a rule. J. D. W.

REVIEW OF DENTAL LITERATURE AND ART.

BY J. H. M'QUILLEN, D.D.S.,

PROFESSOR OF ANATOMY, PHYSIOLOGY, AND HYGIENE IN THE PHILADELPHIA DENTAL COLLEGE.

THE HUMAN TEETH IN THEIR RELATIONS TO MASTICATION, SPEECH, AND APPEARANCE.*

An Address delivered before the Delaware Dental Association.

GENTLEMEN:—In compliance with your appointment I appear before you this evening,—not, however, as an essayist, for my time has been so much engrossed by various duties since the nomination as to preclude the possibility of preparing a written address, but rather in an oral communication, which to me, from years of habit in the lecture-room, is decidedly preferable, to invite your attention to the consideration of the *Human Teeth in their Relations to Mastication, Speech, and Appearance.*

The varied and extended character of the subject demands that it should be treated in a general and suggestive manner; and my object in

* The illustrations accompanying this communication were engraved from specimens in my possession.—J. H. McQ.

selecting it was, that it might awaken a spirit of inquiry in these various directions, and that the knowledge thus obtained might be made instrumental in securing to patients beneficial, practical results.

To prevent confusion and secure clearness of conception, it will be advisable to consider the subject under separate heads, and commencing with the first.

Mastication.—It may be truly said that a just appreciation of the position which the human teeth occupy as masticating agents, can only be obtained by familiarity with the comparative anatomy of the dental organs; for in the structure of the teeth there are certain characteristic differences, corresponding with the habits of the animal and the kind of food upon which it subsists; and in the mouth of man teeth are found belonging to different classes of animals, whose habits and food are of the most opposite character. In illustration of this point, the craniæ of man and various animals, lying on the table, are presented.

With regard to the entire animal series, the teeth may be defined as hard organs situated on the inner surface of the digestive canal, varying in *shape, size, number, and location,* with the character of the materials which they are intended to comminute. By some animals they are employed as offensive and defensive weapons in prehension; by others, as organs of locomotion; again, they are used by certain kinds of fish in crushing the stony shells inclosing their food; as in the case of the *sheep's-head fish* and the *parrot-fish, (scari.)*

Although man and several of the animals have thirty-two teeth belonging to the permanent set, the typical number of the *vertebrates* is forty-two. Some of them, however, are *edentulous,* or without teeth; others have but one tooth, and from this they range upward to such a large number, that to those who have not examined the subject, it must appear incredible. Thus birds are found invariably *edentulous,* the gizzard serving as the comminuting organ; while at the other extreme, fish are supplied in the most liberal manner with teeth. In many of the vertebrates the teeth are firmly implanted in the maxillary and premaxillary bones. In other cases, as in certain kinds of fish, the teeth are inserted not merely in the maxillary and premaxillary bones, but in the palate bones, vomer, pharynx, on the tongue, and in the stomach; being so numerous, and in such peculiar positions, that it is quite difficult to count them; running as high as one hundred and forty in some, and in others to one hundred and ninety, and beyond. Wherever found, while they may subserve other purposes, they are invariably necessary agents in the prehension or comminution of food.

In fish and serpents, with the exception of the poison-fangs of venomous reptiles, the teeth are merely organs of *prehension,* and prevent the escape of the prey after being seized; and which, as a general thing, is swallowed entire.

The comparative anatomist, in making the diet a means of classification—as in the carnivorous and herbivorous animals—takes advantage of certain marked characteristics in the digestive apparatus to divide these animals. These peculiarities, however, are not confined to the dental organs only, but a constant relation is maintained between the shape and structure of the teeth; the articulation of the jaw; the form of the stomach; the length of the intestines, and the nature of the food on which the animals subsist.

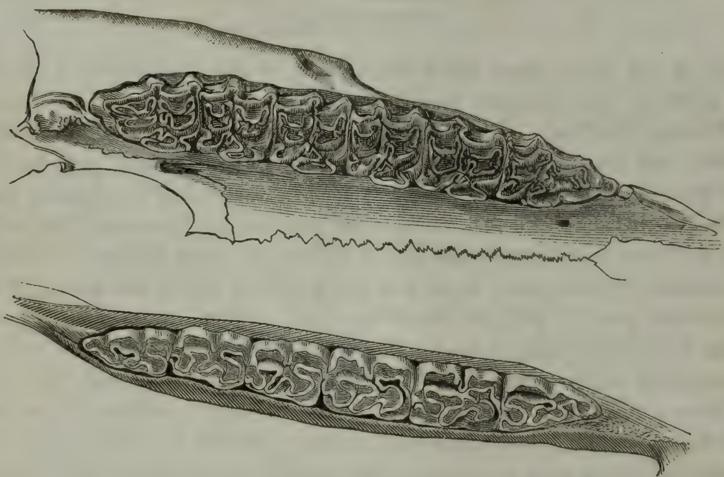
Thus the teeth of the truly *carnivorous* animals are fitted to seize their prey and lacerate the food, but not to thoroughly masticate it. These organs are of three kinds, and adapted to different mechanical purposes.

POLAR BEAR.

Thus, in the *polar bear*, the *incisors*—six in the *superior* and six in the *inferior maxillæ*—are so formed and situated as to serve as shears in dividing the food. The *canines*—two above and two below—long, curved, and sharp-pointed tusks, possessing great strength, and deeply and firmly implanted in the jaws, are used by the animal as offensive and defensive weapons, and for seizing upon and holding its struggling prey. The *molars*—four on each side, above and below—have cutting or trenchant crowns, with serrated edges and sharp points, which are arranged in a direction parallel with the line of the jaw; and the superior teeth have a flat inner side, against which the inferior works like a scissor-blade. These teeth serve to mangle rather than thoroughly comminute the food of the animal. The jaws are strong, and the deep and narrow glenoid cavities in the temporal bones receive the condyloid processes of the inferior maxillæ in such a manner as not to admit of any horizontal motion, either backward or forward, or from side to side. This articulation, constituting the pure ginglymous, or hinge-like joint, affords the lower jaw only the upward and downward movements. In addition to this, the wide and deep temporal fossæ give an extensive origin to the immense temporal muscles inserted into the coronoid processes of the lower jaw; and the zygomatic processes are very strong and prominent, and the masseter muscles arising from them, and inserted into the rami and body of the lower jaw, are large, broad, and powerful; while the pterygo-maxillary,

and pterygoid fossæ, giving origin respectively to the external and internal pterygoid muscles, are, comparatively speaking, quite shallow, and the muscles small. By this arrangement in the shape and position of the teeth, the articulation of the jaw, and the origin and insertion of the muscles, the animal is enabled to seize upon and hold its prey. Any other kind of joint, under such circumstances, would prove not merely unreliable, but actually worthless. In the carnivora the stomach is simple, and the intestinal canal is remarkably short in relation to the length of the body.

Passing to the *herbivora,* and selecting the horse as an example of this class, the *incisors—six* in number in both jaws—are arranged in a curve at the anterior end of the jaws, and are employed as prehensile organs in seizing upon and cutting off the herbage on which the animal subsists. The *canines,* small in the horse, and rudimental in the mare, are situated in the upper jaw, in the middle of the long interspace between the incisors and molars, while in the lower jaw they are close to the outer incisors. They subserve no purpose in mastication, this being effected altogether by the *molars,*—these are six in number, for each side of the upper and lower jaws,—and the crowns of which present two double crescents, the convexity being turned inward in the upper and outward in



MOLARS OF HORSE.

the lower ones. In addition to this, the triturating surface is found to present a series of inclined planes, leading from prominent ridges to large hollow cavities lying at their base; the inequalities thus presented being due to the unequal wear of the different tissues composing the crown. The grass, either in a green or dry state, on which the herbivora subsist, containing as it does large quantities of pure silica or flint, produces decided abrasion of the teeth, particularly the molars. If the teeth,

although presenting a rough masticating surface when first erupted, had been composed of only one tissue, they would soon have worn smooth, and proved inadequate to the service demanded. To meet this emergency, therefore, the different tissues composing the teeth—the enamel, dentine, and cementum—are arranged on the same plane. By such a contrivance the teeth necessarily wear unequally, and always present a rough, uneven, grinding surface to the food.

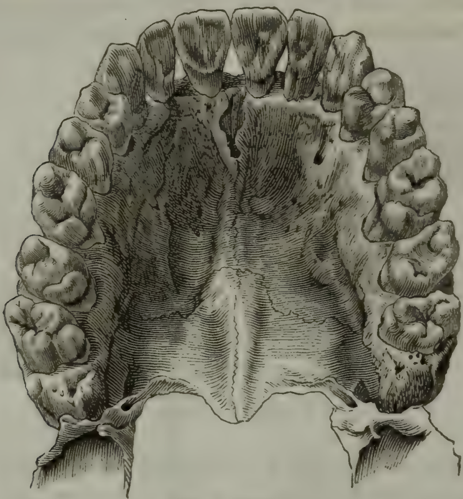
The glenoid cavities in the temporal bones of the horse and herbivorous animals generally are quite shallow, and the condyloid processes of the lower jaw rounded. The joint thus formed not only admits of upward and downward movements, but also of extensive sliding motions in every

SKULL OF HORSE.

direction. In addition to this, the temporal fossæ are quite narrow and shallow, the zygomatic processes not very prominent, and the temporal and masseter muscles arising from them are feeble, in comparison with those of the carnivora. The pterygo-maxillary and pterygoid fossæ, however, are quite deep, and the external and internal pterygoid muscles arising therefrom largely developed. By the action of these muscles the horizontal rubbing motion of the roughened surfaces of the superior and inferior molars against each other is effected, and the coarse articles of food are thoroughly triturated and reduced to a pulpy mass. One *order* of the herbivora—the *ruminantia*—possesses the faculty of returning the food to the mouth and subjecting it to remastication, after it has been once swallowed. This is due to the remarkable arrangement and action of the stomach, which, as in the cow for instance, is of immense size, and divided into four compartments or stomachs. Another marked peculiarity of this order is the absence of incisors and canines in the upper jaw. The animal, when feeding, after slightly bruising the coarse vegetation by a first mastication, swallows the bolus, which passes along the œsophagus to the paunch or first stomach, and then by small portions to the second stomach, where, after being subjected to an elevated temperature for some time and mixed with the secretions, portions of it are compressed into

little pellets, which successively ascend to the mouth, to be rechewed; after this is thoroughly effected, the food is again swallowed, and passes on to the third stomach, a channel being formed through the first two by the contraction of the groove or gutter made by the prolongations of the œsophagus; here it remains a certain length of time, and then passes into the fourth stomach, the true digesting organ, which is analogous to the simple stomach of animals in general.

In *man* the teeth occupy a position intermediate to those of the carnivorous and herbivorous animals. Twelve of the teeth, viz., the *canines*



HUMAN TEETH.

and the *bicuspids*, correspond to those of the former; and twenty, the *incisors* and *molars*, to those of the latter. The *canines*, however, are much less prominent and pointed than in the carnivora; and the *molars*, while they resemble those of the herbivora, in being thick and strong and presenting comparatively flat surfaces, at the same time, in place of the curvilinear ridges of the herbivora, have more or less conical eminences like those of the carnivora.

The form of the articulation of the lower jaw and the organs of digestion, not less than the teeth, present strong evidence that man is truly omnivorous, and afford a clear physiological argument in favor of the mixed animal and vegetable diet which custom and taste have decided to be natural for the human species; while the vegetarian theory, which rigidly excludes everything like animal food, under all the varying circumstances of climate and temperature, is in opposition to the indications afforded not only by the structure, but also by the practice of man. Millions, it is true, avoid flesh altogether, but millions also use it extensively. In the torrid zone there is little or no occasion for its employ-

ment, while in the cold climates, particularly in the frigid zone, it is imperatively demanded; and there is no fact more incontrovertible than that the highest order of physical and mental development is found in those countries where the inhabitants unite animal with vegetable food. As there are cutting, tearing, and grinding teeth in man, so the articulation of the lower jaw is intermediate to those of the animal and vegetable feeder. Thus the transverse condyles of the jaw are received into the glenoid cavities, so as to admit of not only upward and downward, but also of considerable lateral or sliding motion; and the temporal, masseter, and pterygoid muscles effecting this, and the temporal fossæ, zygomàtic processes, and the pterygo, maxillary, and pterygoid fossæ from which these muscles arise, hold the same intermediate relation to the animals already referred to. By this arrangement the act of mastication in man, unlike the simple laceration of the food on the part of the carnivora, can be as perfectly effected as in the herbivora; and although the articles of diet are, to a great extent, freed from impurities and softened by cooking, this should be done; for, while some human beings are in the habit of bolting their food, indulgence in such a practice is invariably followed by the most unpleasant results. The human stomach in nowise resembles, as the practice of some would seem to indicate, the gizzard of birds, where hard and otherwise indigestible substances can be triturated; nor does it possess the faculty of returning imperfectly masticated food to the mouth for a second and thorough comminution, as in the ruminantia; neither is it like the stomach of the carnivora, which frequently digests with ease large portions of bone; but it is so constituted as to demand the most perfect and minute division of the food in the mouth. It is truly said that food well chewed is half digested. If, in place of this, it is swallowed in undivided masses, it becomes a source of irritation by remaining a long time undissolved in the stomach; and, if this practice is continued for any length of time, dyspepsia, with its attendant train of horrors, is evoked. The Americans, in their all-absorbing pursuit of business or pleasure, perhaps more than any other people on the globe, violate, in the most reckless manner, this canon, and, as a consequence, lantern jaws and disordered stomachs are universally presented to view. If more time was devoted to the thorough mastication of the food, in place of being time wasted, it would result in increased comfort, physical and mental *power* and *endurance*, and length of years.

(To be continued.)

"Fatal Effects of Laughing Gas.—Mr. Samuel P. Sears, a merchant doing business at No. 23 Park Row, on Monday evening called at the establishment of Dr. Joseph Brunett, dentist, No. 373 Canal Street, and requested him to extract two or three decayed teeth, also requesting the dentist to administer to him nitrous oxide gas, better known as

'Laughing Gas.' Mr. Sears being to all appearance in perfect health, the operator administered the gas and drew the teeth. The patient seemingly recovered from the effects of the inhalation, and went into an inner room, but soon returned and complained of shortness of breath, and sank on a sofa, expiring in a few moments. The deceased was removed to the residence of his parents, No. 274 West Twenty-second Street, where an investigation by Dr. George B. Bouton revealed the fact that the lungs of deceased were very much diseased. Dr. Bouton is of the opinion that the quantity of gas inhaled would have had no injurious effect on a person in ordinary health. Coroner Wildey held an inquest on the body, and the following verdict was rendered by the Jury: 'We find that deceased came to his death by congestion of the lungs, caused by inhaling nitrous oxide gas. We exonerate the person who administered it, but recommend that hereafter an examination be made by a competent person of any one who contemplates inhaling said gas.'"

The above extract, from the *New York Tribune*, is presented as the first instance on record of death resulting from the employment of nitrous oxide as an anæsthetic. With no disposition to indulge in any unnecessary comments upon this unfortunate case, but on the contrary, sympathizing with the person in whose hands it occurred, and who is a gentlemanly and respectable practitioner, and has been fully exonerated by the verdict of the Coroner's jury, at the same time as a journalist, having at heart the great interests of humanity in general, and the profession in particular, I cannot refrain from saying that, when taking into consideration the reckless manner in which this agent has been used by many irresponsible persons, it is rather a matter of surprise that serious, if not fatal results have not occurred before this. An agent capable of producing by its inhalation in a very few minutes nervous exaltation of the most remarkable character, accompanied by perfect anæsthesia, cannot be justly or safely regarded as an agent *so harmless* as to be intrusted to the hands of children or novices. Like all such powerful remedies, its administration should be made in the most careful and circumspect manner, by those who are perfectly acquainted with its properties, and the means to be employed in untoward cases, combined with the *promptness* and *coolness* which calls up *instantly, and makes such knowledge available when demanded.*

In the hands of the best informed and most experienced, unfortunate results *may* supervene. In asserting this, it is the opposite of what some highly respectable medical, surgical, and dental practitioners assume, and who state that they recognize no condition of the human system, no condition of the brain, heart, lungs, and other organs, in which ether, chloroform, and other anæsthetics may not be employed with perfect safety by judicious hands. With all respect, courtesy, and kindness toward these gentlemen, such an extreme position is neither justifiable nor tenable, and they cannot be regarded as irresponsible, when uneducated and inexperienced parties, becoming aware that such views are entertained and ad-

vanced by those high in authority, assume, in the employment of these agents, the boldness and foolhardiness so well described by Pope, when he says—

"Fools rush in where angels fear to tread."

Again, to say that there is no condition of the economy in which anæsthetics may not be employed, is in direct opposition to facts recognized as far back as the days of Hippocrates, and on which the law of *idiosyncrasy* is based. No one would have the temerity to deny that in some systems the smallest quantity of morphia will produce decided cutaneous irritation, or that in others an infinitesimal dose of calomel will excite profuse ptyalism; instance after instance might be cited in the same direction, but, permitting this to suffice, it may be truly and safely *asserted*, that anæsthetics are not exempt from, but come under the operation of the law of *idiosyncrasy.* For while the vast majority of persons are not unpleasantly affected by such agents, the indications in some cases are decidedly adverse to repeating an administration.

In writing thus, I wish to be regarded as opposing the *abuse,* not the *use,* of anæsthetics, and if more is claimed for an agent than observation or reason can justify, it is an *abuse* of that article; and when irresponsible parties, acting upon such assumptions, jeopardize or destroy life, the abuse becomes criminal.

There can be no question that the popular idea that nitrous oxide is so *perfectly harmless* as to preclude the possibility of danger under any circumstances, has had much to do with the *furore* accompanying its recent revival as an anæsthetic, after remaining unnoticed and unemployed for so many years after the death of Dr. Horace Wells, who, by its means, first demonstrated and made public the fact that anæsthesia could thus be induced. Owing to this impression of the harmless nature of the agent, many who have been quite averse to handling ether and chloroform, have seized upon this with avidity. That its inhalation cannot be regarded as entirely exempt from untoward results, has long been inferred by those perfectly acquainted with its composition and properties. It requires, however, some painful accident to prove to the world at large that which the close observer and reasoner naturally and logically infers from analogy. When unfortunate results supervene, the reaction upon the public mind is such that the condemnation and abnegation of an article becomes as wide spread and unjust as the previous commendation and unrestricted employment was unwarranted.

In conclusion, the ably-written, judicious, and well-timed remarks of Dr. Ziegler, on "NITROUS OXIDE AS AN ANÆSTHETIC," in the PERISCOPE department of the December number of the DENTAL COSMOS, will repay a careful perusal.

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THE DENTAL REGISTER OF THE WEST—NOVEMBER.

"TRANSACTIONS OF THE AMERICAN DENTAL ASSOCIATION.—The Transactions of the last meeting of this body are now ready for distribution to all the members of the Association who have paid their annual dues, or may now pay the same; and also for sale to any who may desire to purchase them. Every member of any Association represented should have a copy of these Transactions. The Publication Committee have, in accordance with the suggestions made, had quite a number bound up with all the former Transactions, for those who may prefer to have them all in one volume rather than two. Those having the former volume, of course will not wish this double volume; for all such the present Transactions are bound separate. We shall, without delay, send them to all entitled to them, and any others desiring to obtain them, can do so through any of the Publication Committee.

"The price is for the single volume $2 00, and for the double volume, or the whole from the begining, $3 00.

"The Publication Committee are:—Drs. J. Taft, H. A. Smith, H. R. Smith, of Cincinnati; C. W. Spalding, of St. Louis, Mo.; Wm. A. Pease, of Dayton, O. T."

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THE LONDON DENTAL REVIEW—DECEMBER.

"ODONTOLOGICAL SOCIETY OF GREAT BRITAIN. November 2d, 1863.—Mr. COLEMAN read a paper on 'Cystic Tumors,' of which the following is an abstract. He said: While proposing to offer some observations upon cystic tumors in general, it was more especially to those arising from, or developing, teeth, that he wished to direct their attention. * * * Cystic tumors he divided into two classes: firstly, those arising from, or formed out of, some previously existing structure; and, secondly, those which arose as distinct and independent bodies—new formations. Under the first might be reckoned the dilated ducts of certain glands, distended cellular tissue, etc. Of that class of tumors they had many instances in connection with the teeth. Thus, the peridental membrane might become detached from the fang of a tooth and secrete in the sac thus formed, the ordinary products of a cystic tumor. He had recently brought a case of that kind before the notice of the Society, in which there had been alveolar abscess, and the fang of the tooth was removed, which allowed the pus to escape. At the extremity of that fang was found a small sac composed of dense fibrous tissue, from which no fluid could be squeezed. The necrosed fang or sac had evidently given rise to the abscess, but the tumor was quite distinct from the abscess. Cystic tumors arising in that manner were by no means uncommon, and many of the so-called cases of dropsy of the antrum were in reality, he believed, simple cystic tumors arising from the periosteum of a tooth. The fluids contained in those tumors were not those secreted by a mucous membrane, but resembled the ordinary contents of a serous cyst. Those cysts might sometimes take on a suppurative action. Such a case came before his notice in a middle-aged woman, a patient at the Metropolitan Free Hospital. Cystic tumors were also formed from the capsules of teeth in cases of retarded dentition. Teeth might be developed in the substance of either the upper or lower jaw, and there remain without appearing or causing any inconvenience during a long life. It might be otherwise; the capsule of the

tooth may become distended with serous fluid, causing absorption of the surrounding parts, and finally, by the inconvenience of its size or the deformity it produces, call for some surgical interference, when, after evacuating the tumor of its contents, a tooth is found loose or having its fang imbedded in its walls.

"The second class of cystic tumors were those that were developed as new formations and from no previously existing tissues. Hodgkin divided them into two classes—simple cysts and compound cystic tumors. The former consisted of a simple cyst containing serous or albuminous fluid; the latter consisted of many cysts, (multilocular.) The former possessed but little interest as compared with the latter, in which teeth, as well as other structures, were not unfrequently found; and it was especially to those dentiferous and piliferous tumors that he wished to direct attention. His opportunities for investigating them had been fewer than he could have desired; but through the kindness of Mr. Savory he had been permitted to examine several preparations in the Museum of St. Bartholomew's Hospital. A still more favorable opportunity was afforded him under the following circumstances:—A patient who had experienced a difficult delivery at her last confinement made application to Dr. Greenhalgh, at St. Bartholomew's Hospital, who discovered a tumor occupying the lower portion of the pelvis. Under those circumstances she was admitted into the hospital, and, when labor commenced, delivered by the Cæsarean operation. The patient soon sank after the operation. A post-mortem examination showed a large cancer connected with the right ovary. On examining the tumor several cysts were found; one containing teeth, hair, and fatty matter. The existence of tumors containing fatty matter, hairs, teeth, etc. had been long recognized, and from hairs having been most frequently found in them, they had been called by many piliferous tumors. The hairs found in many cystic tumors mixed up with fatty matter were sometimes rolled up in that substance in a manner as to lead Hodgkin to believe that there must be a rotary movement in the interior of such tumors. The hairs were to be found of all colors, lengths, and sizes. In one case recorded they were short, pointed, and thick, like eyelashes. Salter spoke only of fœtal hair being found in ovarian tumors; Dr. Tilt, on the contrary, said they were not fœtal hairs. Skin was also found, which Salter said differed in no way from ordinary skin upon the surface of the body, except that it was destitute of sweat glands and basement membranes. In a section of the skin seen upon the table the epidermis is unevenly distributed. Two hairs may be seen, one small, having no axis substance like fœtal hair, the other large, having distinct axis substance like hair of adults. He had examined several specimens of skin from ovarian tumors, but had failed to find any sweat glands, which some had stated to exist. He had also looked for papillæ, both in the skin and mucous membrane, but had been unable to discover them. The mucous membrane appeared very much like ordinary mucous membrane taken from the mouth, excepting in its being perfectly destitute of mucous follicles and papillæ. The chief interest in reference to the mucous membrane was the development of teeth upon it. The skin was seen in close proximity, developing hairs and sebaceous follicles; on the mucous membrane they suddenly terminated, and in their place, apparently, the teeth were produced. The various links found in different animals, where hair became gradually converted into teeth, naturally suggested the great resemblance these struc-

tures bore to each other, and might, perhaps, lead them some day to regard a tooth as a number of hairs developed *en masse*.

"The teeth, no doubt, arose from papillæ on the surface of the mucous membrane, but he had not been able to prove it was so. In some cases the teeth seemed to have their fangs imbedded only in mucous membrane and in the walls of the cyst. In other cases the teeth were found with their fangs in bony alveoli, but sometimes in bony crypts, like cases of retarded dentition. The form of the teeth varied greatly, but they were found to resemble temporary, permanent, and supernumerary and malformed teeth—the latter being the most commonly met with. He had been unable to arrive at any satisfactory conclusion as to whether the permanent teeth were developed as offshoots from the temporary, or whether they arose from independent pulps, nor could he find any case recorded that would justify the belief that if formed as offshoots from the temporary, the latter were absorbed and fell out. One point remarkable was the want of order both as regarded the form, position, and number of teeth contained in these tumors. Their position was most irregular, like the other contents of tumors. The teeth were almost invariably those of the upper jaw. The number of teeth varied considerably; most frequently one only had been found, and from that all numbers were mentioned up to 300.

"*Structure of the Teeth.*—The enamel was found more or less imperfect, sometimes being almost deficient. The dentine appeared more perfectly formed than enamel, and could not be distinguished from that occurring in teeth taken from the mouth. The cementum was mixed up with the dentine and irregularly distributed. A point of considerable interest was that the teeth occasionally possessed no pulp cavity. In the pulp of a partially formed tooth he found what he had every reason to believe were nerve-fibres, but the pulp was so far decomposed that he should have felt some difficulty in stating it positively, had not Mr. Salter clearly proved their existence. Blood-vessels they certainly contained. Bone was formed in these tumors by ossification of the cartilage, (fœtal,) and from fibrous tissue. The centres of ossification were scattered very irregularly."

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THE ATLANTIC MONTHLY—JANUARY, 1864.

MY BOOK.—The following extract, from that humorous and genial satirist, Prof. Holmes, shows up, in a very happy manner, the disposition too common with many writers, of unnecessarily obtruding themselves upon the notice of readers:—

"Well, friend, when you have satisfied yourself with the limiting, you begin on the descriptive adjectives, and pronounce me egotistical. Certainly. I should be unlike all others of my race, if I were not. It is a wise and merciful arrangement of Providence, that every one is to himself the centre of the universe. What a fatal world would this be, if it were otherwise! When one thinks what a collection of insignificances we are, how dispensable the most useful of us is to everybody, how little there is in any of us to make any one care about us, and of how small importance it is to others what becomes of us,—when one thinks that even this round earth is so small, that, if it should fall into the arms of the sun, the sun would just open his mouth and swallow it whole, and nobody ever suspect it, (*vide* Tyndall on Heat,) one must see that this

self-love, self-care, and self-interest play a most important part in the Divine Economy. If one did not keep himself afloat, he would surely go under. As it is, no matter how disagreeable a person is, he likes himself, —no matter how uninteresting, he is interested in himself. Everybody, you, my critic, as well, likes to talk about himself, if he can get other people to listen; and so long as I can get several thousand people to listen to me, I shall keep talking, you may be sure, and so would you,—and if you don't, it is only because you can't! You are just as egotistical as I am, only you won't own it frankly, as I do. True, I might escape censure by using such circumlocutions as 'the writer,' 'the author,' or still more cumbrously by dressing out some lay figure, calling it Frederic or Frederika, and then, like the Delphic priestesses, uttering my sentiments through its mouth, for the space of a folio novel; but at bottom it would be my own self all the while; and besides, in order to get at the thing I wanted to say, I should have to detain you on a thousand things that I did not care about, but which would be necessary as links, because, when you have made a man or a woman, you must do something with him. You can't leave him standing, without any visible means of support. One person writes a novel of four hundred pages to convince you in a roundabout way, through thirty different characters, that a certain law, or the mode of administering it, is unjust. He does not mention himself, but makes his men and women speak his arguments. Another man writes a treatise of forty pages, and gives you his views out of his own mouth. But he does not put himself into his treatise any more than the other into his novel. For my part, I think the use of 'I' is the shortest and simplest way of launching one's opinions. Even a *we* bulges out into twice the space that *I* requires, besides seeming to try to evade responsibility. Better say '*I*' straight out,—'*I*,' responsible for my words here and elsewhere, as they used to say in Congress under the old *régime*. Besides being the most brave, 'I' is also the most modest. It delivers your opinions to the world through a perfectly transparent medium. 'I' has no relations. It has no consciousness. It is a pure abstraction. It detains you not a moment from the subject. 'The writer' does. It brings up ideas entirely detached from the theme, and is therefore impertinent. All you are after is the thing that is thought. It is not of the smallest consequence who thought it. You may be certain that it is not always the people who use 'I' the most freely who think most about themselves; and if you are offended, consider whether it may not be owing to a certain morbidness of your taste as much as to egotism in the offender.

"Remember, also, that, when a writer talks of himself, he is not necessarily speaking of his own definite John Smithship, that does the marketing and pays the taxes, and is a useful member of society. Not at all. It is himself as one unit of the great sum of mankind. He means himself, not as an isolated individual, but as a part of humanity. His narration is pertinent, because it relates to the human family. He brings forward a part of the common property. He does not touch that which pertains exclusively to himself. His self is self-created. His imaginative may have as large a share in the person as his descriptive powers."

CHICAGO EVENING JOURNAL.

"DEATH OF DR. CREIGHTON.—A meeting of the dentists of Chicago was held at Dr. S. S. White's Dental Depot, on Monday evening, at

which the following resolutions—presented by Drs. Allport, Dean, and Young, committee—were unanimously adopted :—

"WHEREAS, It has pleased an overruling Providence to remove from our midst Dr. Samuel T. Creighton; therefore

"*Resolved*, That in his death the dental profession has lost one of its most energetic and conscientious members—the poor a warm-hearted and generous friend—the church a worthy and active member, and Chicago a most exemplary and upright citizen.

"*Resolved*, That while we sympathize deeply with his family in their bereavement, we rejoice that they have the consolation of knowing that he had the Christian's hope of a glorious immortality.

"*Resolved*, That the dental profession, as a token of respect to his memory, will attend his funeral in a body.

"*Resolved*, That the secretary of this meeting be directed to hand a copy of the above resolutions to the family of the deceased, and to request their publication in the city papers, and the various dental journals of the country.

GEO. H. CUSHING, *Chairman*.

"S. R. BINGHAM, *Secretary*."

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BOSTON MORNING JOURNAL.

"HARD RUBBER PATENTS. *To the Editor of the Boston Journal.*—Allow me to correct the statement contained in your paper of this day, respecting the injunction against me. Proceedings were brought against me, charging that I had violated two patents controlled by the American Hard Rubber Company of New York, one of said patents being for the article itself, called Hard Rubber, the other for the method or process so called of producing such *Hard Rubber*, and the Court was applied to to prohibit me from using the *article* or *substance*, (Hard Rubber,) for the base of artificial teeth, and from selling the same when so made. This was exactly what the Court was requested to do by the complainant's bill, and the Court did no such thing.

"In fact, the Court did not pass at all upon the patent for the substance or article called Hard Rubber, as to which only there was a denial of novelty on my part.

"I did not deny that the process patented was novel. I resisted the injunction in regard to the use of the process, on the ground that the American Hard Rubber Company itself had compounded and placed in the market for sale the very material called *Vulcanite base*, etc., which I had purchased and employed as a part of the process described in one of the patents, and which was made and sold for that very purpose, and was incapable of any other use. The answer to this was that the Hard Rubber Company did not know of or consent to the sale to me or any other unlicensed dentists of this article, and the Court issued the injunction, as I understand, because it did not appear from the evidence that the Hard Rubber Company did consent to the sale to me of the gum used by me. It is perfectly notorious that this gum has been sold freely by their consent in the market, and on the production of this evidence to the Court, I have reason to believe the injunction now granted will be dissolved.

J. R. DILLINGHAM,
No. 12 *Winter Street.*

"BOSTON, Jan. 18."

PERISCOPE OF MEDICAL AND GENERAL SCIENCE IN THEIR RELATIONS TO DENTISTRY.

BY GEO. J. ZIEGLER, M.D.

"*The Influence which the Mind exerts over the Body.*—Although such influence has long been recognized, it has been proved in recent times to be far greater than was formerly supposed. Thus, although it is universally known that mental emotions exercise a stimulating or depressing effect on all the bodily functions, and that various feelings, desires, and appetites increase or diminish the secretion of different glands, it has been reserved for modern times to demonstrate that in certain persons sensation and volition can be thoroughly controlled by the suggestive ideas of another individual. If, for example, twenty persons, chosen at random from the population, have their attention strongly directed to any object for fifteen or twenty minutes, it has been shown that two or three of them so lose their power of comparison and resolution to act, as to be incapable of exercising their judgment, of determining the nature of their sensations, or of controlling their movements. They become the slaves of predominant ideas for the time being, and, although in every respect healthy, may be made to believe and do anything, however ridiculous or absurd, at the command of another. History from the remotest times presents us with examples where individuals, singly or in multitudes, led away by such predominant ideas, have performed acts thought to be miraculous, and suffered no pain from injuries which under ordinary circumstances would have produced the greatest agony. Thus the effects produced on many votaries during their initiation into the ancient mysteries; the ecstasies of the Pythian and other priestesses; the stoicism of Indian warriors at the stake, and the insensibility of men excited in battle or by strong religious enthusiasm; the dancing epidemics of St. Vitus or of tarantism in the middle ages; the phenomena induced by magic, incantation, and the evil eye; the hallucinations of the convulsionaries at the tomb of St. Medard in Paris; the sensorial delusions described in the legends of the saints, in the journal of Mr. Wesley, in the religious camp meetings of America, and among our revivalists in recent times; the results of mesmerism, table-turning, and spirit-rapping produced in the present day, are all of a similar character, and indicate the remarkable influence which the mind possesses over the sensations, emotions, volition, and indeed all the animal functions.

"This power has always been seized upon by certain individuals as a means of cure. Hence in ancient times the benefits which resulted from consulting oracles, visiting certain shrines, or making pilgrimages. Charms, amulets, and relics have been known at once to remove all kinds of pain, and produce wonderful cures; and the same thing has resulted from intense religious, political, or martial excitement. The Royal touch, the bezoar stone, zinc rings, wearing the mistletoe and other sacred plants, have all been lauded as means of recovery from diseases. So far from the alleged cures in this way having been improbable, does not all that we know of the effect of confident promises on the one hand, and implicit belief on the other, render it likely that they actually occurred? If so, this power must be taken into account in every true system of therapeu-

tics; its influence must be recognized, and we ought to endeavor to make it amenable to scientific rules.

"The late Mr. Braid, of Manchester, unquestionably did much to give effect to the therapeutic exercise of the mind upon the body. By suggesting thoughts to his patients in various ways, or by diverting them to certain subjects, occasionally rendering them more vivid by repetition, or by definite physical impressions, he fixed certain ideas in their minds. These ideas he found to act as stimulants or sedatives according to their purport and the current of thought directed to or withdrawn from particular organs or functions. He has recorded remarkable cases where a judicious application of this doctrine has removed insomnolence or various kinds of pain, spasms, and other evidences of excitement; where hysterical paralysis of the limbs or special organs of sense has been relieved and cured; and where the torpid functions of lactation, perspiration, digestion, defecation, menstruation, and so on, have in this way been rendered more active. Indeed, there can be no question that the beneficial effects of many drugs and systems of treatment which are really inert or uncertain in their action, and which are supposed to operate through the blood on the glands, muscles, or nerves, truly act by exciting expectant ideas, and through such ideas indirectly on the parts disordered.

"As an illustration of what can be done in this way, I may mention the case of a young lady under the charge of the late Dr. Johnston, of Berwick-upon-Tweed, affected with hysterical paralysis, who had for several years been under the care of Sir Benj. Brodie, Mr. Syme, and other eminent surgeons, who recognized the nature of the case, but could do nothing. Dr. Johnston read some remarks on 'Hypnotic Therapeutics,' published in the *Edinburgh Monthly Journal* by Mr. Braid, and sent his patient to him at Manchester. By giving confidence to this lady, inducing her to walk freely and trust herself, so to speak, on her limbs, a perfect cure was effected in four days, when she moved about without any lameness, or, as it was said by the reporter, 'with the grace of a queen and the agility of a sylph.'

"I venture to say that cases of this kind constitute one of the great therapeutic advancements of modern times, being not only directly applicable to the cure of maladies, but indicating a most important principle explanatory of innumerable recoveries hitherto too much neglected by the medical profession, and accounting for the well-known fact that in many instances he is the best physician who succeeds in gaining the confidence of his patient."—(J. Hughes Bennett, M.D., *Lancet.*)

"*On Latent Syphilis, and its Effects on Healthy Females and on the Fœtus in Utero.* By Langston Parker, F.R.C.S., Honorary Surgeon to the Queen's Hospital, Birmingham, etc. etc.—I venture in the following paper to narrate some facts which I have personally observed in reference to the cause or mode of production of congenital and hereditary syphilis, and also to speak of the influence of latent syphilis in producing disease in healthy females, and in the fœtus in utero.

"Infants who are born with the symptoms of syphilis, or who exhibit such symptoms at an earlier or later period after birth, (without direct contagion,) are the subjects of either congenital or hereditary disease. By congenital disease I mean that both mother and father were healthy at the time of conception, but that the mother, becoming diseased at some period of her pregnancy, contaminates the fœtus in utero, and gives

birth to a diseased infant. By hereditary disease, I understand that the mother had symptoms of syphilis before she conceived, or, that she being healthy, the father was the subject of a constitutional syphilitic taint, either manifest or latent. There may seem little importance in this distinction; but a little reflection will show that there is a marked difference between the two states; its bearing on prognosis is also very important, since in the first variety, the congenital, the infant is frequently cured; while in the second it more commonly dies, or is the subject of symptoms which continue for longer or shorter periods, or through the whole of life, rendering the health feeble and precarious.

"Syphilis must have a starting-point either in one parent or the other, or both; and although this is frequently found in the mother, still I believe it is much more common to find it in the father.

"The mother may become the source of disease to her offspring in four different ways:—

"1. She may be diseased before conception.

"2. She may become diseased after she has conceived.

"3. She may disease her infant in its passage through the vagina or external parts,—a source of infection formerly supposed to be very common, but in reality very rare.

"4. She may disease her infant after birth. The father has, however, generally the most direct influence on the health of mother and child, and it is generally to him that, in the first instance, the origin of the contagion may be traced.

"In the first place, the contagion may be direct. A man having an uncured chancre marries a healthy woman; he communicates the disease to his wife; the local disease is followed by a constitutional taint, and in this condition she conceives and gives birth either prematurely or at her full time to a diseased living child, or aborts, or is prematurely delivered at some period of her pregnancy of a dead one. Here the mode of infection is direct, clear, and unmistakable; so much so, that it is unnecessary to bring forward cases in support of it.

"Secondly. A man, the subject of a well-marked constitutional syphilis, at some period before his marriage more or less remote, but who at the time of his marriage presents no symptom of syphilis whatever, either primary or constitutional, neither has done so for months or years previously, marries a healthy woman. His wife conceives, and, as in the last case, either prematurely or at her full time gives birth to a diseased infant, or aborts, or is prematurely delivered of a dead one. In this second form of infection the woman remains healthy, and does not exhibit either before or during her pregnancy, or after delivery, any symptom of syphilis. The only evidence of disease is in the infant. I say the only evidence, because doubtless, in such cases, syphilis exists in the father in a latent state: whether it exists at all in the mother is doubtful; but, practically, and to prevent a recurrence of this mischief in future pregnancies, both parents should be submitted to an anti-syphilitic treatment.

"If the parents remain untreated, the same occurrence, *i.e.* the birth of a diseased child, may take place after future pregnancies. I have known this extend to the sixth pregnancy, and neither father nor mother exhibit any symptoms of syphilis during the whole time; when both parents were treated a healthy child was born. I have placed this case on record, but such occurrences are not uncommon. I adduce a few cases in support of what I have just stated:—

"*Case* 1.—A. B., aged 36, consulted me in 1860. He had chancre in 1848, followed by lepra and psoriasis affecting the body, hands, and feet. He married a healthy female in 1853, having for a long period exhibited no symptoms of syphilis. His wife gave birth to her first child in the seventh month of her pregnancy. Her second child had pemphigus when it was three or four weeks old, and died. The third child had well-marked symptoms of syphilis—breaking out and puckering of the mouth. This child also died. The mother has never had any signs of syphilis, either in the organs of generation or elsewhere.

"*Case* 2.—In August, 1852, I treated a patient for a well-marked attack of syphilitic lepra. The symptoms disappeared under a treatment which was not very protracted, nor was it very regularly followed. In 1854, this patient married a healthy young woman, who, in 1855, was prematurely delivered of a dead child. In 1856, she was delivered, at her full time, of an infant, which appeared well and hearty for three weeks. It then began to 'snuffle,' had puckerings, and a dry eruption about the mouth, and two large vesicles of pemphigus on the thigh and on the side. The child was treated by mercurial inunction on flannel bandages round the knees, and cured. In this case the father had no symptom of syphilis for three years prior to his marriage, yet the disease appeared in his offspring. The mother never had any disease at all. I repeatedly and most carefully examined her.

"*Case* 3.—A patient was under my care in the Queen's Hospital some years ago with a very formidable attack of pustular syphilis. While he was in the hospital, his wife brought her infant to me, covered with scaly blotches. The child was plump, and apparently healthy when born, but a few weeks afterward the blotches broke out, and the health began to decline. The mother had no symptom of syphilis; her breasts were free from ulceration. I also carefully examined her with the speculum four or five times, but the uterus was entirely free from any evidence of syphilis. The child was treated by dusting the body over daily with dry calomel; it was cured by this plan. The mother was not treated. During the two years she was under my observation she had no symptoms of disease.

"In these three cases it will be observed, that although the mother gave birth to diseased children, they apparently escaped contagion; they had no symptom of syphilis. In the two first cases also, syphilis existed in the fathers in a latent state; they had no symptom when their wives conceived. All these cases were under my own care, but additional ones may be collected from the practice of others of a precisely similar character. M. Diday, in his excellent work on 'Infantile Syphilis,' has recorded six cases entirely confirming the observations I have just detailed.

"These cases show a syphilitic father, either with symptoms latent or manifest—a syphilitic child—a healthy mother. M. Diday says: 'Numerous and precise facts furnish a positive demonstration of this theory; the mothers were healthy, and there was no reason to suppose that they had been infected.' These six cases will be found in detail at pp. 15 and 16 of M. Diday's work on 'Infantile Syphilis,' the Sydenham Society's translation. The explanation of these cases appears to be that the ovule is impregnated with diseased semen, and the product of the ovule is consequently diseased. It is very common to see symptoms of constitutional syphilis appear many years after the healing and supposed cure of the

primary disease; and on the same principle must be explained the procreation of diseased offspring by men who have not exhibited any outward mark of syphilis for very long periods before marriage. In such cases the disease is 'latent.' M. Cazenave calls this the sleep of the virus.

"The mother, however, does not always escape under the circumstances I have mentioned as affecting the father. To this part of the subject I shall return presently, but I wish here to show, before proceeding, that the father in whom syphilis is latent occasionally diseases his wife, without the occurrence of pregnancy, and without his having at the time, or having had for a long period, any symptom of syphilis.

"*Case* 4.—I treated a patient, otherwise of very excellent constitution, for a chancre, and the constitutional accidents which succeed it, during the years 1860 and 1861. During the whole of 1862 there was no evidence of disease, nor has there been since. As he was engaged to be married, he visited me from time to time that I might satisfy myself and him that no symptom of disease existed. I repeatedly examined him, and most carefully, with this view. He married, after having been free from any symptom of syphilis for more than a year. About five months after marriage he brought his wife to me, who was suffering from severe nocturnal pains in the head, which ordinary treatment had not relieved. I was of opinion that the nocturnal pains were indications of a commencing syphilitic taint, although there was at that time no other symptom to support my opinion; but I had previously seen several cases where such a form of headache had been the precursor of other symptoms of syphilis. These headaches, although they had resisted ordinary treatment for more than a month, were relieved at once by blue-pill and opium, and the iodide of potassium; in three days they had disappeared, but shortly after the patient was covered with syphilitic roseola, and had two soft chancres in the vulva. She was not pregnant, and never had been. The husband continued to appear in the most robust health.

"*Case* 5.—Again, in 1861, I treated a patient for an indurated chancre and the constitutional accidents which succeeded it. In the autumn of last year he married an exceedingly healthy-looking and interesting person, at that time having no symptom of syphilis, and not having had any since the attack for which I attended him in 1861. When he married no trace of syphilis existed, nor had there been any symptoms for about 18 months. Six weeks after marriage his wife's health began to decline; she became covered with an eruption, and had great irritation in the vagina and urethra. In this state he brought her to me. I recognized an aggravated syphilitic roseola; she had in addition several hard, knotty lumps in the labia, which are so characteristic, and also intense vaginal irritation, with discharge. She was not and never had been pregnant.

"In these two cases we notice latent syphilis in the husband, who diseases a healthy wife, without the occurrence of pregnancy. I quote one other case, personally observed, where the syphilis was manifest and not latent, but where the same effect was produced in a female not pregnant.

"*Case* 6.—A. B., married some months after the symptoms of a formidable attack of secondary syphilis had disappeared, at the time of his marriage believing himself quite well; shortly after marriage his throat became affected, and ultimately assumed a most serious form of secondary phagedæna, (in this state I was requested to see him in consultation.) One day his wife called on me respecting the health of her husband, and

I ventured to ask her if she felt quite well; she said no; for soon after her marriage she began to suffer from a vaginal discharge, with great irritation; I pressed her to submit to an examination, which she did. The vagina was intensely red, covered with aphthous patches, and superficial ulceration, and the os uteri was red and swollen, and in the same condition as the vagina, and the labia had the same lumpy or knotted condition as in the last case.

"In none of these three instances was there any pregnancy. In each of the cases the patients were only recently married, and in each case the husband was apparently free from disease at the time of his marriage.

"Three cases very similar to those I have just mentioned—and entirely confirming the points they were intended to illustrate, that men, apparently free from syphilis, but who have at some period of their lives been the subjects of a constitutional taint, may produce disease in healthy females without pregnancy—are recorded by the late Professor Porter, of Dublin, in the 46th No. of the *Dublin Quarterly Journal* for May, 1857. While the fact of late years, at least, has generally been admitted that a female previously healthy may be contaminated by a man suffering from latent syphilis, it has been supposed by many that she does not thus suffer, except she becomes pregnant, and that she is contaminated more directly by means of the fœtus in utero—though indirectly of course through the father.

"I am now as certain as I can be of anything in the domain of medicine, that a healthy female may be contaminated by a man apparently healthy, but who has been the subject of a syphilitic constitutional taint, and may receive from him a constitutional disease, without pregnancy or a primary sore having preceded it.

"The cases I have quoted appear to me conclusive on this point, and they receive additional support from the evidence of M. Diday, Mr. Porter, and others. In the first class of cases to which I have directed attention, the mothers gave birth to diseased children, but themselves had never exhibited any symptom of disease. In the second class of cases, healthy women were diseased by men suffering from latent syphilis, but no pregnancy existed. There is, however, a third class, which I now wish to speak of, where the same conditions exist on the part of the man, but where the female not only brings forth diseased children, but is herself the subject of disease. The mother does not always escape under the circumstances I have mentioned in considering the first class of cases, and one or two modern writers have incorrectly asserted that she never does if she gives birth to a diseased child. M. Charrier, in the *Archives Générales* for September, 1862, relates the histories of six cases of this nature, and says that if a woman give birth to a diseased child, or if the infant show symptoms of disease during the first year after birth, without direct contagion, that she either is, or has been, the subject of a constitutional taint. However frequently this may be the case, and every one must know that it is commonly so, it cannot be looked upon as a law without numerous exceptions. There are many instances in which the mother never exhibits the least symptom of disease, although it becomes absolutely necessary to make careful and even repeated examinations of the uterus before giving a decided opinion upon this point. A man at a period more or less remote before marriage is the subject of constitutional syphilis; he marries a healthy female, having had no evidence of syphilis for some time before. Sooner or later his wife becomes pregnant, and

her health begins to fail; she exhibits symptoms of syphilis; she aborts, or is prematurely delivered of a dead or diseased fœtus, or, if she go her full time, the same effects are manifest—the infant is born either dead or diseased, or shows symptoms of disease sooner or later after its birth.

"I detail a few cases which will illustrate this position: O. P., well known to me, contracted a chancre in 1854. This was followed by a sore throat, ulcers on the tongue, and a scaly eruption on the body, on the hands, and on the feet. In 1858, this patient married a plump, handsome, healthy wife, having had no symptom of syphilis for two years. She soon became pregnant, and her health began to decline. In the fourth month of her pregnancy she first suffered from bearing-down pains, and great vaginal and vesical irritation; she had hard lumps in the labia, and a scaly eruption on the abdomen and arms. Some of these symptoms disappeared under treatment, but not all. At the end of the seventh month she was delivered of a puny, emaciated infant, which died in a few days; but after delivery the bearing-down pains continued.

"She became a second time pregnant, and was again prematurely delivered at the end of the seventh month of a diseased child, which died in a few days. During this pregnancy the bearing-down pains continued, and she had a sore throat. She became a third time pregnant, went her full time, and was delivered of an apparently healthy child. This child in three weeks had a scaly eruption and condylomata of the anus, but was cured by mercurial treatment.

"She became a fourth time pregnant, and was delivered at the end of the seventh month of a diseased child, which lived only a few days. During the whole of this time the bearing-down uterine pains continued, and one symptom or another of constitutional syphilis was always present, even when she was not pregnant. This patient, although I well knew her, was not professionally under my care till after the birth of her fourth child. After having been made aware of the details of the case, and especial stress having been laid on the bearing-down pains, I suggested that a speculum examination of the uterus should be made, which had not been previously done, and I forbore suggesting any line of treatment till I knew the result, as I ventured the opinion that the patient had a chancre of the uterus, which produced the bearing-down pains, and which, it will be recollected, had existed from the time the first symptoms of syphilis manifested themselves. I did not make the examination, but a large ulcer was found occupying the lower lip of the uterus. This is a very remarkable case, showing not only that the semen of a man with latent syphilis can disease both wife and fœtus in utero, but that it may produce ulcers in the vagina and uterus which have all the character of chancres. This patient also suffered from muco-purulent discharge from the uterus; and it may be recollected that in my paper on 'Syphilis of the Uterus' I particularly drew attention to this symptom, considering it, under such circumstances, a distinct and positive manifestation of secondary syphilis. I am not singular in this opinion, but I cannot now refer to corroborative testimony.

"I bring forward one other case only. A gentleman contracted a chancre in June, 1858, which healed without leaving any induration behind it. In October, believing himself well, he married a healthy lady, and shortly after that he had a sore throat, which was reported syphilitic. Six weeks after marriage his wife had soft chancres on the labia. She became pregnant, and miscarried at the fourth month. She became again

pregnant, and miscarried at the sixth month. She became a third time pregnant, and was prematurely confined at the eighth month of a child, which lived only fourteen days, and was covered with a well-marked syphilitic eruption.

"In this case we observe secondary symptoms occurring in the throat shortly after marriage, proving clearly that the husband at the time of marriage was in that condition which Gamberini has denominated the truce of syphilis; the disease was latent; the symptoms were suspended; the syphilis was not cured.

"The cases I have related must, I think, carry conviction to the mind that syphilis may exist in a latent state in the system for an indefinite period without betraying itself by any outward or evident symptom, and yet it may manifest itself after marriage in the wife and in the offspring in the several ways I have passed hastily in review. Socially, this question is of the first importance; and two questions naturally suggest themselves for solution at this stage of the argument. Are there any symptoms by which latent syphilis can be recognized? and is a constitutional taint once contracted ever perfectly cured?

"With regard to the first point, the disease would be no longer latent if it were manifested by any symptom. I believe there are no means of knowing whether syphilis exists in a latent state or not. I have known patients robust, healthy, florid, and strong, procreate diseased children, and that has been the case in many of the instances I have brought forward in this paper. I am sure none of the persons alluded to, some of them personally known to me, would have entered the marriage state had they supposed for a moment that they were laboring under the least suspicion of a syphilitic state. There is, however, another and a brighter side to this question. Many persons who enter the marriage state, having previously been the victims of constitutional syphilis, do not procreate diseased children; many children born of parents thus situated are healthy when born, and have never exhibited in after years any symptom of contamination. I have personally observed many of these cases, some of which I have placed on record. In fact, I have known a man marry with a bad constitutional taint upon him have healthy children, and neither they nor his wife suffer. The explanation of this is difficult, and I believe it impossible to say whether a man who has been the subject of constitutional syphilis will have healthy or diseased children. There are many circumstances which would enable the surgeon to give a probable, but not, I think, a certain or positive opinion. The facts which clinical experience teaches are: that any man who has once been affected with constitutional syphilis, although he may have been for some time free from outward or visible symptoms of the disease, may beget a diseased child; but, on the other hand, both wife and child may escape, from some hidden causes not yet explained, or very imperfectly so. There are several theories on this point,—but what difficult point of medicine is not beset with theories?—and none of those I have seen recorded afford us any satisfactory data upon which to form an opinion.

"One remark before I conclude. Is there a test of the cure of syphilis? I think if a man having had constitutional disease marry a healthy female, and neither she nor her offspring ever exhibit any mark of syphilis, we may safely hazard the opinion that the father is cured, and this is the best and perhaps the only one that can be given. Unhappily, however, for this test, syphilitic fathers, with evident syphilitic symptoms,

sometimes beget healthy children, and do not disease their wives; these, I am willing to admit, are exceptional and rare cases, but there are several on record. I think, on the whole, this is the best and safest test I know of, and upon it, in giving an opinion, I generally rely.

"There are many points of the highest importance which I have left unmentioned in this paper. One more point only I mention, and that bears upon treatment. All I have to say in reference to this is, that if a man marry a healthy woman, and disease her and his offspring, it is a proof that syphilis exists in him in the latent state, although not manifested in him by any outward or visible sign; and it is the duty of his surgeon to submit him again to treatment, whatever treatment he may have gone through before; and not only should this be done, but the parties should be sexually separated for a time, and the wife also submitted to treatment, whether she have any symptoms of syphilis or not, if she have brought forth a diseased child. If the child be alive, of course that also should be submitted to treatment. The nature of the treatment of such case and of such individual, of course must be determined by a variety of circumstances, of which the most important are the health and constitution of the parents, the nature of the syphilitic symptoms, and the form of treatment which had been previously adopted."—(*Med. Times and Gaz.*)

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Neuroma.—The *Chicago Med. Journ.* gives the following interesting extracts from an essay on this subject, by PROF. JOHN A. LIDELL, of the Nat. Med. College, Washington. "These nerve tumors vary in size, from a pin head to a melon. In shape they are regular, and either oval or elongated, their long axis always corresponding with the direction or course of the affected nerve. In structure, they are either cystic, which is the exceptional form, or cystico-solid, or entirely solid, (sarcomatous,) the latter being the common form. It is believed by some surgeons that, when the solid growth reaches a considerable size, one or more cysts, or cavities, filled with yellowish, brownish, or reddish-brown liquid, are apt to form in the interior, their formation being apparently due to a process of disintegration having commenced therein. Sometimes the tumor appears to be composed of concentric layers. In color, the interior structure varies from white or grayish-white, to a yellowish or reddish-yellow hue. In consistence, they vary from the deuseness of fibrous tissue, and the hardness of cartilage, to the soft, fluctuating feel of a sero-cyst. With regard to mobility, *neuromata* are, for the most part, *distinctly movable in the direction of their transverse diameter*, but not in the direction of their long diameter, and this mobility is seldom or never destroyed by contracting adhesions to neighboring parts. Every effort to move these tumors in the course of their long diameter is productive of great pain. The skin investing these morbid growths is never discolored, and the cutaneous veins are never enlarged and tortuous, except the tumors have attained an unusual size; indeed, the integument in general is never affected by this disease in any other way than by mechanical pressure. These nerve tumors are surrounded or invested with a distinct capsule formed from cellular tissue, condensed by the progressive expansion of the swelling, and it frequently happens that, within this covering, a second can readily be distinguished, formed by the expanded sheath of the parent nerve. *Neuromata never invade the contiguous parts by infiltrating them with their own peculiar substance, and thus imposing on them their*

own peculiar structure. They invade the neighboring parts only by mechanically pushing them away as they expand, and by slowly producing absorption of them from long-continued pressure. *Neuromata never infect the lymphatic glands*, neither in their own neighborhood nor in remote parts of the body, *and when properly excised never return.* In all these respects they differ widely from cancer, and are entirely dissimilar thereto in their real character. Neuromatous tumors are commonly found single, though they are occasionally multiple, and in very rare instances, according to the monograph already referred to, as many as several hundred are found in the same subject. The *painful subcutaneous tubercle*, three examples of which are referred to by Chesselden, is one of the most frequent forms of neuroma. Nerve tumors, though commonly, are not always painful. The simple is much more liable to be painful than the multiple form of the disease. The pain, when present, has a peculiar character; the torture is agonizing, and the pain darts 'along the trunk and branches of the nerve, with all the suddenness of an electric shock;' the pain is paroxysmal, and the exacerbations may be produced by pressing upon, handling, or jarring the tumor, by strong mental emotion, by fatigue, and by changes in the hygrometrical condition of the atmosphere, disappearing in dry and clear, and coming on again in damp and cloudy weather. In respect to origin, neuroma is considered to be either spontaneous or traumatic; but whether spontaneous or traumatic, we are no nearer the truth with regard to the special perversion of the nutritive function, upon which the growth of such masses depends. Traumatic neuroma is most frequently seen in the stump of amputated limbs, and its treatment should be conducted on precisely the same principles as that of the spontaneous form of the disease.

"Neuromata generally increase in size slowly and steadily. It is said that they never retrocede or disappear spontaneously. Medicines, whether applied locally or taken internally, do not appear to possess the power to stop, or even to retard their growth materially. Extirpation affords the only certain cure, and extirpation by the knife, or excision, is preferable to that effected by any other method. Excision of a portion of the parent nerve, together with the tumor, has also been recommended, but I cannot conceive that this procedure is often necessary. Sometimes, by the exercise of great care and skill, the tumor can be dissected away from the nerve with which it is in contact, without dividing said nerve, a feat which Velpeau accomplished in a case of neuroma sciatica. These tumors should not be excised, unless they are painful, or cause inconvenience to the patient by their size or weight.

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"Neuroma is distinguished from carcinoma by the following facts: 1. It never affects the surrounding parts otherwise than by pressure, whereas carcinoma involves the neighboring tissues by infiltrating them, and imposing on them its peculiar structure. 2. It never contaminates the neighboring lymphatic ganglia; carcinoma does. 3. While it impairs the patient's general health by pain and distress, causing pallor, emaciation and debility, it never produces the true cancerous cachexy by specific infection of the system; carcinoma does produce such a result. 4. It does not return after excision; carcinoma does. 5. The pain of neuroma is neuralgic (electrical and paroxysmal) in character; the pain of carcinoma is not."

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Precautions in the Administration of Chloroform. By EDWARD ELLIS, M.D.—"I had occasion a short time ago to remove a piece of darning-needle, broken into the palm of the hand, and which had been in several days, causing great pain and annoyance. From the unusual sensibility of the parts, the lady entreated to have chloroform, and declared that the least touch caused her agony. Finding it impossible to do anything without, I administered chloroform myself, intending when she became fully narcotized to entrust my assistant to keep her under as long as I might require. I had not given three drachms when insensibility came on with a quietness of the voluntary muscles that I always regard with suspicion, and almost instantly I noticed a sudden sinking of the pulse, though there was no change in the pupil or respiration. I immediately discontinued the inhalation, and by the usual means succeeded, after some little time, in restoring the patient. In this case probably a few moments' intermission in carefully noting the pulse would have caused another death from chloroform.

"An example of the danger of not entrusting the administration of chloroform to a second person during an operation came under my notice about two months ago. One of my patients had occasion to consult a dentist. She went to one, who said he would give chloroform himself. As two teeth were to be extracted and others stopped, narcotism was pushed pretty far; but probably from the fact of having to hurry, or from suspecting that matters were not altogether right, both the teeth were broken, and the greatest possible difficulty ensued in restoring consciousness. When at length the lady revived, to ease her pain, some anodyne was given, and from the combined effects of the anodyne and the secondary effects that occasionally follow the use of chloroform, the lady's life was (on her reaching home) for some hours in jeopardy. She was at length restored by constant frictions, artificial respiration, and powerful stimulants, among which it seemed to me that strong coffee acted most satisfactorily. This same lady had the stumps lately removed under chloroform, without the least ill consequence; but the chloroform was administered by a surgeon, who attended to that, and nothing else.

"It seems, therefore, that though it is impossible to over-estimate the benefit of chloroform, and though its use is, on the whole, attended with the utmost safety, (only 1 in 16,000 cases proving fatal,) yet, that the public may have due confidence in its administration, it should never be given but by a second person, who may devote his energies entirely to watching its effects, and so leave the surgeon free from any sense of anxiety, to operate leisurely and with discretion."—(*Lancet.*)

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"*Swallowing Leeches.*—DR. BAISEAU, an army physician in the French service, has published a paper in the *Abeille Médicale* on the consequences resulting from swallowing leeches, an occurrence by no means unfrequent in Algeria, where these creatures abound in most rivers and ponds. Soldiers on a march are apt to drink carelessly at the first brook they meet with, especially in hot weather, and the Algerian leech is peculiarly adapted to escape an inexperienced eye, being as thin as thread, and not quite two inches in length, so that at first sight they have the appearance of a bit of grass. They generally attach themselves to the pharynx, and more seldom to the palate or velum pendulum; sometimes they will get into the nose. There have been cases of their sticking to the borders of the larynx, and even penetrating into that organ. When they have once

fixed upon a place they remain stationary, and soon swell to a considerable size. They will stay in for months. Men who have got a leech in the pharynx or fauces become aware of it by spitting blood; the leech cannot always be seen, not even by pressing the tongue down. Most of the patients feel a certain inconvenience within, and a constant desire to swallow, but in the beginning the leech is small and is not much felt. The tail of the creature sometimes tickles the lower part of the tongue, and causes coughing, nausea, or retching. If the leech is fixed near the larynx it will impede respiration, and sometimes bring on asphyxia. In the nose it will cause constant bleeding, and the patient will complain of an obstruction in his nostril. The loss of blood, though small in the beginning, will in the end produce anæmia and general weakness. The diagnosis is easy, but practitioners who are not aware of the possibility of the accident may sometimes be at fault. The leech will sometimes shift its place, but it seldom gets out of itself, it must be extracted, or its extraction effected by remedies. When visible, they may be got out by a pair of tweezers with curved extremities; but where one cannot see, one runs the risk of tearing the mucous membrane. When the tail of the leech can be seen, the practitioner must try and catch it at once, otherwise the leech draws its tail back and disappears. If the extraction is impossible, recourse must be had to the remedies employed for detaching leeches when applied externally. The patient is made to drink vinegar and water, or a solution of salt. Gargles, with the same substances, are also prescribed, and this must be continued for several days before the leech can be got rid of, and sometimes these remedies are of no avail. Salt may be blown into the pharynx, or a wet sponge introduced, having salt sticking to it. If the leech is in the larynx, tracheotomy is the only remedy.* To prevent the soldiers from swallowing leeches, they are advised never to drink water on a march without straining it through a piece of linen."—(*Dublin Medical Press.*)

"*Red Line on the Gums in Phthisis.*—This sign, the importance of which was insisted on by the late Dr. T. Thompson, has been investigated by Dr. J. Picard. He has found it present in thirty-five consumptive patients, in all stages of the disease; sometimes on both gums, sometimes on one only. In some cases it extended along the whole length of the gum, while in others it was limited to one or two teeth; sometimes it was continuous, sometimes interrupted. The color varied, being an intense red, or a violet or rose hue; sometimes scarcely deeper than that of the pallid gums themselves. In most instances, the line was level with the gum; sometimes it was raised; its breadth varied from one-hundredth to eight-hundredths of an inch. Sometimes there was a diffused ill-defined redness, which gradually shaded into the color of the gum. In some patients the red line disappeared as the disease advanced. In twelve cases, the gums were in so bad a state that it was impossible to arrive at any result from examination. The line was present in twelve doubtful cases of phthisis; and was absent in fourteen others. It was well marked in fifteen very healthy persons, who were free from cough, and regarding whom there was no reason for expecting that they would become phthisical.

* As the vapor of turpentine, vinegar, molasses, etc., with or without that of water, may be inhaled, or an aqueous solution of salt, sugar, or other unirritating anthelmintic be injected into the larynx with comparatively little danger, such measures should be tried before the final resort to this operation.—Z.

Dr. Picard observed the red line also in twenty cases of various diseases, especially typhoid fever. It is also strongly marked in persons who have been taking iodide of potassium or mercurials, or who have slight gingivitis from incrustation with tartar. Dr. Picard derives the following conclusions from his observations: 1. The red line is frequently present in pulmonary consumption, but has no semeiological value, since it is met with in non-phthisical persons, and is absent in some who are manifestly consumptive. 2. Instead of increasing with the evolution of the tubercular disease, the red line may disappear at an advanced stage of the malady. 3. The existence of the red line in persons in good health does not warrant the prediction that they will become consumptive."—(*Brit. Med. Journ.*, from *Gazette des Hôpitaux*, and *Am. Journ. Med. Sci.*)

"*Result of Experiments on the Growth of the Jaw.* By G. M. HUMPHREY, M.D., F.R.S.—It had been shown by the author in a former paper read before the Cambridge Philosophical Society, as well as by other physiologists, that the enlargement of bones does not take place by interstitial growth, like that of other structures, but solely by addition at their surfaces, edges, and ends; the addition of osseous matter, at some parts, being usually attended with more or less removal at others, so as to maintain the proper shape and proportions of the bone. The object of the communication was to show in what manner this principle is carried out in the jaws so as to make room for the permanent teeth which are both larger and more numerous than those of the first dentition.

"It was shown with regard to the lower jaw, that the five middle, or front permanent teeth, (the two incisors, the canine, and the two bicuspids,) occupy precisely the same space as their predecessors of the first series, (the two incisors, the canine, and the two primary molars;) the third primary molar, which is a permanent tooth, (the first permanent molar,) occupying the same position throughout life; and all the additional teeth of the permanent series (the second and third molars) are added to the hinder part of the jaw. Hence the *fore* part of the arch of the jaw, the part containing the primary teeth, undergoes very little change of size throughout life, being nearly as large in the new-born infant as in the adult; and the teeth which occupy it in the adult require only the same space as their predecessors in the infant. The jaw is deepened at this part and strengthened by addition, beneath, in front, and behind; but no alteration in the shape or size of its arch takes place.

"How is the space gained in the back part of the jaw for the additional teeth—viz., the three molars? To ascertain this with certainty the author made experiments upon young pigs, passing wires round the condyloid and coronoid margins of the ascending portion of the jaw, and killing the animals at variable periods afterward. The result of these experiments, which were detailed at the meeting, was to prove that the body or dental part of the jaw is lengthened by gradual addition to the hinder or condyloid edge, and by absorption of the anterior or coronoid edge of the bone. The molar teeth, when first formed, are placed, successively, quite beneath the coronoid process; and by the absorption of the anterior edge of that process they are subsequently exposed, and a clear surface is left for them. The lengthening of the bone by addition to its hinder edge is accompanied by a gradual shifting of the periosteum and other soft parts, along the surface of the bone, toward that edge.

Thus the proper relations of the soft parts to the bone are maintained, (as explained, with reference to the long bones in a paper by the author, published in the *Transactions of the Medico-Chirurgical Society*, vol. xliv.;) and the mental hole is carried a little backward and acquires a slant from within outward and backward in consequence of the traction of the nerve upon it during the shifting of the soft parts upon the bone.

"The additional molars grow up in the same line with the primary teeth; so that, although the horns of the alveolar arch are lengthened, and the arch is rendered more elliptical, it is not widened. The widening of the jaw, in correspondence with the increasing width of the base of the skull, takes place behind the alveolar arch, in the ascending portion, and is affected by progression of absorption on the inner, and addition to the outer surface of this part.

"In the upper jaw the course much the same. The fore part of the dental arch is but little altered. The permanent molars, developed behind and above one another in the 'tubercle,' descend, and the space for them is formed by the backward growth of the tubercle, and by changes in the pterygoid processes in the sphenoid corresponding with those in the coronoid processes of the lower jaw."—(*Brit. Med. Jour.* and *Dub. Med. Press.*)

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Relative Weight of Bones.—"M. de Luca has laid before the *Académie des Sciences* the results of his investigations concerning the relative weights of the bones of the adult skeleton. 1. The bones of the right half of the human body are heavier than the corresponding bones of the left side—this law applying even to the bones of the head. 2. The bones situated above the umbilicus equal in weight those situated below it. (In the erect position of man, the umbilicus represents a central point equidistant from the two extremities, the arms being carried vertically above the head.) 3. The mean weight of the bones of the hand is the fifth part of the total weight of the entire arm, just as the length of the hand is the fifth part of the entire arm. 4. The total weight of the bones of the hand may be divided into five equal parts, one being represented by the carpus, two by the metacarpus, and two by the fingers. The first phalanx represents in weight two-thirds of the entire finger, and the other third is represented by the phalangine and phalangette. 5. As a mean, the bones of the hand weigh one-half less than those of the foot. 6. In the foot the bones of the tarsus weigh double those of the metatarsus, and the weight of the toes may be divided into three parts; two for the phalanges, and one for the phalangines and phalangettes. 7. These relative weights hold good with regard to the lower animals."—(*Med. Times and Gaz.*)

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"*Callus.*—Dr. Jobert de Lamballe has communicated to the Academy of Sciences an interesting paper on the formation of callus, the substance provided by nature for the junction of bones severed by fracture. The ancients attributed the formation of callus to the secretion of a gelatinous substance between the fragments, which substance, by hardening gradually, soldered, as it were, the fragments together. Some also admitted the elongation of the osseous fibres. Antonio Xeide was the first to remark, from experiments upon frogs, that a stratum of blood surrounded the fragments, and that this blood passed through several states until it became a cartilage, then a bone; and that it united the fragments by

forming a sort of ring round the fracture. John Hunter confirms this view, adding that the arteries deposit calcareous matter on the fracture, which contributes to the ossification of the callus. Haller and Dethleef are of opinion that callus is formed by a gelatinous juice issuing from the extremities of the fractures, and chiefly yielded by the marrow. Having spread round the fracture, it gradually coagulates and becomes cartilage, in which certain osseous nuclei are formed, which gradually spread and transform the cartilage into bone. According to these authors, the periosteum exercises no influence over the formation of callus. But the latest theory, advocated by Duhamel, Fougeroux, Dupuytren, Cruveilhier, and Flourens, on the contrary, attributes a fundamental action to the periosteum and the medullary membrane. Not only these, but also the ligaments, the cellular tissue, and the adjoining muscular strata become ossified to form a ring around the fracture. Two successive calli are formed —the provisional one in the course of thirty or forty days, by the ossification of the periosteum and the surrounding parts, and of the medullary tissue. This, however, is gradually absorbed and succeeded by a definitive callus, which solders the extremities together, and takes no less than eight months or a year for its formation. This theory, I know, is opposed by many eminent French surgeons, among whom I may mention Dr. Gosseli, Professor of Surgery of the Medical Faculty, of this city. He expresses the opinion that not only the periosteum and the medullary membrane, but also all the adjoining parts, such as the blood-vessels, the different tissues, etc., contribute, each for its part, to the regeneration of bone."—(DR. W. N. COTE, *Med. and Surg. Reporter.*)

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"*Treatment of Neuralgic Affections.*—DR. GIRAULT stated at a late sitting of the Académie de Médecine, that he cures neuralgia, hemicrania, and similar affections, by letting ether drop for several minutes on the painful region, or by covering it with a piece of wadding or lint dipped in that liquid. Now, as other refrigerants are inefficacious in such cases, Dr. Girault is of opinion that the good effects of ether are owing to absorption. The same practitioner presented a patient to the Academy who had just been cured of an attack of lock-jaw by" [a like external application of] "ether."—(*Ibid.*)

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Dentistry in Australia.—"Among the many curious modes of making money in Australia, none, I think, surpasses the following: A surgeon told me that he went one day into the tent of a brother medicus, on the Bendigo, just as a patient was going out. 'I have been stopping a tooth,' said the surgeon. 'Do you get good cement here?' inquired my friend. 'Admirable!' replied the surgeon. 'I saw an old gutta-percha bucket selling in a lot of old tools one day at an auction. I bought the lot for the sake of the bucket, which cost me five shillings. I have already stopped some hundreds of teeth with the gutta-percha at a guinea each, and shall, no doubt, stop thousands with it before the old bucket is used up. It is a fortune to me. My name is up for an unrivaled dentist, and they come to me from far and near.'"—(*Exchange.*)

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"*Process for Bleaching Gutta-Percha.*—Dissolve the gutta-percha in twenty times its weight of boiling benzole, add to the solution plaster of very good quality, and agitate the mixture from time to time. By reposing for two days the plaster is deposited, and carries down with it all the impurities of the gutta-percha insoluble in benzole. The clear liquid

decanted, is introduced by small portions at a time into twice its volume of alcohol, 90 per cent., agitating continually. During this operation the gutta-percha is precipitated in the state of a pasty mass, perfectly white. The desiccation of the gutta-percha, thus purified, requires several weeks' exposure to the air, but may be accelerated by trituration in a mortar, which liberates moisture which it tends to retain."—(*Journ. de Pharm.* and *Am. Journ. Pharm.*)

"*Dry Mounting for Microscopic Objects.*—MR. T. S. RALPH, of Melbourne, communicates to the *Quarterly Journal of Microscopical Science* his mode of mounting certain objects. He punches rings out of thin gutta-percha. One of these rings is placed on a glass slide, and the object arranged in the centre. A covering glass is then placed on the ring, the slide made warm to soften the gutta-percha, and gentle pressure applied, by which it is made to adhere to both glasses. The edge of the cover is finally varnished."—(*Intellectual Observer.*)

"*Artificial Tongue.*—M. MAISONNEUVE, Surgeon of the Hôtel-Dieu, describes in *Cosmos* how he removed from a patient the whole of a tongue afflicted with cancer, by means which he terms *cauterization en flèches.* He perforated the tongue with eight of his cauterizing arrows, (*flèches,*) so as to cause all the affected portions to slough off in one mass. His patient, after the removal of the tongue, could neither swallow nor speak, but performed both those functions on being supplied with a gutta-percha tongue of the natural size."—(*Ibid.*)

"*Explosive Glycerin.*—Nitric acid possesses the property of converting many substances containing carbon into highly explosive agents. It is this acid which converts common cotton into explosive gun cotton. One of the most singular explosive substances lately produced is glonoine, which is made by treating glycerin (a liquid obtained from fats) with a mixture of nitric and sulphuric acids. This product, when heated, explodes with great violence. It has not been applied to any useful purpose, and perhaps it will always be more curious than useful. It is a very powerful poison; one drop taken into the human stomach being sufficient to produce death."—(*Sci. Amer.*)

Gold-colored Alloy.—"A beautiful gold-colored alloy, sold under the name of *Talmi Gold*, gave, on analysis, the following results:—

Copper	86·4
Zinc	12·2
Tin	1·1
Iron	0·3

The iron was probably an accidental ingredient. The alloy besides was very thinly gilt. It is a good deal used to make watch-chains."—(*Central Blatt* and *Chem. News.*)

Cement.—The *Chem. News* says that C. M. WESTMACOTT, of London, has invented "an excellent cement by combining burnt lime with ground chalk or limestone. The best result is said to be produced by the admixture of one measure of the former to two of the latter, but the proportions may be varied. According to the nature of the application, the before-mentioned cement may be used in combination either with sand, clay, plaster of Paris, or other suitable materials."

THE

DENTAL COSMOS.

NEW SERIES.

VOL. V. PHILADELPHIA, MARCH, 1864. No. 8.

ORIGINAL COMMUNICATIONS.

PRACTICAL HINTS.

BY J. D. WHITE.

Diagnosis of Toothache.—There is a class of cases which are all the time giving rise to mistaken diagnosis among patients as well as among dentists, and it is well worth while to give them special attention. They are those cases where the patients are sure that, from their feelings, they can give the dentist positive information. You may have perhaps destroyed a nerve in a first superior molar and plugged it, and every part of the treatment appeared to be entirely satisfactory to the utmost of your expectations, but in a few days, or months, your patient will call and tell you that the tooth you plugged has been for some time giving considerable pain. You will examine the tooth and find that all is apparently as you had left it. But you are told that it is painful to cold water, and aches at night and when anything gets between the teeth. Now you know that a tooth, in which you have killed the nerve and plugged the root, cannot be painful to cold water, or much more likely to be painful at night than in the daytime. You will always suspect that if the patient complains of pain at night and is comparatively comfortable in the daytime, that it is from an exposed nerve.

Case 9 will help to illustrate. Miss E., a lady of eighteen, nervo-lymphatic temperament, teeth decaying rapidly. We treated the first superior left molar for exposed nerve. When in good condition it was well plugged. All things seemed to have been satisfactory. The second bicuspid adjoining was apparently sound except a brown appearance of the enamel, but it was hard to the touch of the instrument. In two months the patient called and complained that the large molar which we had plugged was a cause of great uneasiness, such as pain at night, and painful to cold water. We examined the plug and found it and the gum in a natural condition, but on scraping the brown enamel of the bicuspid

adjoining, it yielded readily to the excavator, and we found that the dentine was very much softened down to the pulp. We applied the nerve-paste and destroyed it, when the sensation to cold ceased. After due time the tooth was plugged and the patient restored to comfort.

Case 10.—A lady, Miss W., about twenty years of age, nervo-lymphatic temperament. We destroyed the pulp in a second superior bicuspid, left side, front surface. The first bicuspid posterior part had been plugged some time. About one week after the second bicuspid had been plugged, the patient returned, complaining of great pain in the tooth we had plugged. We examined the case and found that all was right with it, but the adjoining first bicuspid was slightly tinged with redness. We removed the plug, cut into the pulp cavity, and found the pulp highly sensitive. We applied the nerve-paste, killed the nerve, and the pain subsided. The explanation in the case is, the arsenic had been absorbed by this tooth while treating the nerve in the second bicuspid, and inflamed the pulp. The reddish hue of the tooth, sensibility to cold water, and paroxysmal pain diagnosed the case.

This kind of deception will be frequently met with, and we know of many cases of similar kind, that the plug in the tooth in which the pulp had been treated had been removed and replaced more than once without affording the slightest relief.

(To be continued.)

HYDROSTATIC BLOW-PIPE.

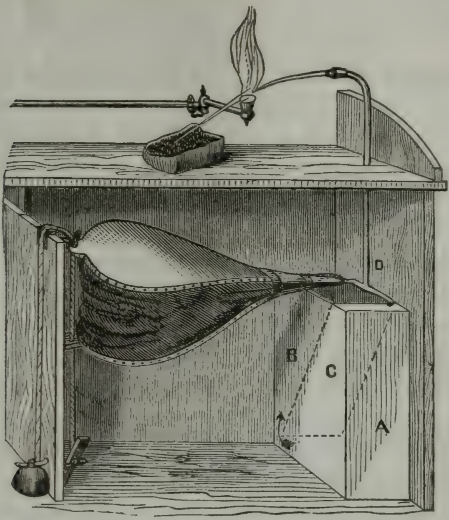
BY C. A. KINGSBURY, M.D., D.D.S.

Professor of Dental Physiology and Operative Dentistry in the Philadelphia Dental College.

Having some time since promised to furnish a description of my hydrostatic blow-pipe for your valuable journal, I will without further delay redeem the said promise. The blow-pipe to which the attention of the profession in this city has been called in some of the recent proceedings of the Odontographic Society and the Pennsylvania Association of Dental Surgeons, has been in constant use in my dental laboratory since 1846. During the summer of that year I met with an intelligent English fancy glass-blower, who had in use a blow-pipe the action and economy of which struck me as just the thing for the dentist's laboratory. According to his statement, it was the joint invention of the celebrated Dr. Lardner and himself. Whether the genius of that truly scientific man was concerned in it, I am not able to vouch; but the apparatus is certainly one of the most simple and effective I have ever seen where a stationary blow-pipe is needed for the dental laboratory.

The accompanying engraving, executed by the talented artist of the Dental Cosmos, will convey to the reader a pretty correct idea of the

form and appearance of the apparatus with its fixtures. A represents a front view of a zinc or copper tank 20 inches high, 15 inches long, and



8 inches wide. B represents a side view; and the dotted line between B and C a partition passing from within about an inch of the front upper angle down to within an inch of the lower back angle of the tank: or, in other words, this partition runs diagonally from the front upper angle to the lower back angle. This partition must be water tight, except at the bottom of the tank, where an open space is left of about an inch, so that when water is poured into the open compartment B—which is nearly as wide at the top as the tank is long—it can readily flow into the compartment C. When the tank is filled nearly half full it will be seen that the great bulk of the water will be in the front compartment C. The bellows is an ordinary large size house-bellows. The end of it rests upon the top of the tank, and the handle of the bottom part is made fast to an upright strip of board. A cord connected with the upper handle, having a weight of four or six pounds attached to the other end, passes over a small pulley for the purpose of raising the bellows. A cord connected with the same handle is attached to a small foot-lever or treadle, and by this means the bellows is easily worked with the left foot. To the nozzle of the bellows there is fastened one end of a plumber's small brass joint; the other end of the joint is soldered to a piece of small-sized lead pipe which communicates with the compartment C at the top. In this brass joint is placed a leather valve—which any dentist of ordinary ingenuity can construct for himself—to prevent the air from returning back into the bellows. Connected with the lead pipe, running from the nozzle to the compart-

ment C, is another piece (D) passing up through the work-bench or table, as the case may be, to which an old-fashioned brass mouth blow-pipe is soldered. When the bellows is worked, the air is forced out of the pipe D and also into the compartment C, which becomes a reservoir for the air. For as the air presses down upon the surface of the water in C it is forced in the direction indicated by the arrow into the compartment B, which is open at the top. As the water is forced by the air in C into B its weight acts upon the air in C to drive it out of the pipe D, and in this way a steady and continuous blast, capable of being graduated to the wish of the operator by the greater or smaller quantity of water acting upon it, may be maintained with the most perfect ease. Any tinman can make the tank and its connections. Tin or zinc will do, but in the long run tinned copper would be the most economical. The apparatus should be placed at one end of the bench, or in some convenient place where it will not occupy much room.

It will be observed that in using this blow-pipe both hands are free to handle the piece of work, and the lungs and mouth are also free to perform their natural functions. I am sure any one using this blow-pipe for one month could never be prevailed upon to abandon it. All who have examined it have become convinced of its great utility, and those of the profession who have had them constructed according to my directions have expressed the highest satisfaction.

The intensity of the flame is such as to enable me to melt an ounce of gold in a few minutes; and it will be found sufficient for all the practical requirements of a dentist's blow-pipe. With the ordinary movable gauze gas-burner for soldering, the size of the flame can be graduated by a slight change in the position of the burner, as may be desired.

Should this description of a most valuable acquisition to the dental laboratory enable any of the members of our rising profession to possess themselves of the means of diminishing the labor and facilitating the operations pertaining to an important branch of our profession, I shall be amply rewarded for the time and labor devoted to this imperfect sketch.

INFLAMMATION.

BY WM. H. ATKINSON, M.D.

Read before the Brooklyn Dental Association.

It may seem impertinent, impudent, and fool-hardy for a mere novice in the philosophy of life-action to presume to assert the conviction of his puerile mind in the face of the learned (?) theses that have for time out of mind been produced upon the vexed question of inflammation.

This process can only occur in living bodies whose nutrient activity is

below the standard of health. To assert that any announcement is new in substance or mode of pronouncement involves a knowledge of all that has ever found conception in fact or means of expression, oral or written. So whatever any one asserts is simply within the range of his observation in nature, schools, or books, and nothing more.

Inasmuch, then, as the inflammatory process is the act of living bodies, it is only understandable through a knowledge of the functions of which it is a modification.

Presuming that all are more or less acquainted with the healthy functions or physiology of the human body, permit me, gentlemen, to make a few statements in a dogmatical manner, leaving it for a future effort to justify them by argument or replies to direct questions as to the positions taken.

The inflammatory process may be fractional or complete, the former indicating arrest at some one of its stages before the final destruction of the part has been effected.

There can be no disease in the system without the presence of some stage of this process. It therefore becomes of the highest possible moment to fully understand the institution, progress, and regress of these stages in combination and alone, so far as cognizable by our perception.

Two prime conditions are necessary to the production and maintenance of this process, viz., perversion of the neural and vascular circulations. Just here a whole chapter of animadversion against existing pathological nomenclature might pertinently be indulged, but we will refrain therefrom, and give what we deem a better, because a simpler and more definite, nomenclature, that we may be the better prepared to administer to the sufferers who may fall into our hands for treatment.

1. Irritation. 2. Stasis. 3. Congestion. 4. Exudation. Up to this point the process is regular whenever not arrested by sufficient cause. We now may name as the 5th stage, termination, so called, of this process, without which it cannot be said to be complete. 1. Resolution. 2. Organization or induration; either of which may be attained without destruction of the part, which may immediately return to a state of health in the former, and mediately through this in cases of the latter. But resolution may be effected in two ways: one fatal to the part, the other benign and conservative thereof. That which is fatal is the solution of decomposition of the blood crasis, chemically or by devitalization, and constitutes the worst form of that which has been termed sphacelous or mortification; while the benign may pass either the ordeal of simple re-solution and resorption, or that form of resolution which is termed suppuration, (which in its most benign form is also reabsorbed at once, or after longer or shorter periods of encystment;) and rupture and discharge of the broken-down exudate with a little cellular tissue involved therein, restoring the parts to normal strength and activity.

Now these stages are not perceptible to the eye, although so painfully patent to the erudite mental apprehension.

I do not pretend that these stages in name are new, but that which is new to the mass of those who have to do with pathological states is, correct and definite apprehension and use of the terms and the states which they indicate.

Writers and speakers do not limit irritation to a single tissue as its seat; neither do they limit congestion, as it should be, to the vascular system, (although in a sense, nerves may be congested, but by an unseen agent ignored by the mass of those who acknowledge and call themselves pathologists.)

Let us ask then what irritation is. It is disturbance of the "me" in its most occult relationship to organism in the sea of nerve aura in the mucoid neurine, within and without the perceptible nervous tracts of the living body; this presence in this location alone constitutes the body a sentient point or individual. If this be apprehended, it is plain, then, that irritation is a dynamic result, that may be purely dynamic or mechanical in its inception, thus limiting all disease to something more occult than perceptible or material organization in the ravages of which we alone cognize its presence by the eye.

And what are we to understand by the term stasis? Simply a standing still of the blood column within the capillaries of the part in which the mischief is, while the general current continues its regular flow, which continuance is the immediate cause of *congestion.* And now let us ask what congestion is. An undue fullness of the capillaries *behind* the point of stasis, which, if continued, will result in "*exudation.*" This last is nothing but a "weeping through" the thinned reticular walls of the capillaries of the more fluid portions of the blood. There is such a state of relaxation of these fine vessels as to permit even blood corpuscles to escape into the cellular tissue, producing petechiæ, (flea bites.)

A frequent exudate in low forms of nervous fever is one of dark grumous appearance, consisting of the broken-down or devitalized blood mass, in which the cruorine is diffused, producing the unsightly aspect. This has been the source of much anxiety among the ignorant attendants upon such cases, mistaking it for diffusive mortification; and, indeed, it is an untoward symptom, and demands prompt oxygenation of the circulation if the patient is to recover.

It will be seen that we make no place for mortification as distinct termination of the inflammatory process, for the obvious reason that it is but the chemical change through which the material elements of the body or part pass in consequence of the absence of the systemic and molecular life.

What is suppuration? Simply a less degree of vital negation of which sphacelus is the type.

The stages of the inflammatory process, then, may be regarded as nothing short of death in the ratio of the presence of the degrees of the stages enumerated, the process, or the system or part, yielding to the conquering force, thus putting an end to the contest between the tendency to health on the part of the system, and death and disintegration on that of the disease.

TEACHING.

BY J. FOSTER FLAGG, D.D.S.

Professor of Dental Institutes in the Philadelphia Dental College.

THAT it is no easy task to instruct, will, I think, be readily acceded when we recognize how few have made themselves acceptable to each one of us during that educational course which has been presented for our acceptance from the days of our childhood even to the present period of our existence.

That the requirements for instructing the youthful and adult mind are widely different, no one would for a moment deny; but the perception of ability for apprehension on the part of the student must be relatively the same: the child must have the mysteries of addition and subtraction explained to him, as must the youth the beautiful demonstrations of Euclid; and that first lessons in geography and philosophy should be made advantageous to the juvenile seeker after knowledge, the information thus imparted should be placed before the understanding, and prepared for mental digestion with as much care and *tact* as would relatively be required to make the mature student clearly comprehend that which is known of the wonders of chemistry, physiology, and pathology.

In that the powers of mental prehension are different, so must the powers of impartation be different; but whether the subjects be simple or abstruse, the good results can only be obtained through the agency of a *forte*, the essence of which is intrinsically the same.

The work of education has often been denominated a "labor of love," and much has been said and written of the trials of the life of a teacher, but it seems to me that some argument might find place in this connection as to where the difficulty should be sought, for in this as in the successful practice of our profession, it is of the utmost importance that we search keenly for the *cause* of disease.

When we see that the task seems irksome, that the instructor labors, that those who would learn are inattentive, that the sitting seems long and the matter uninteresting, may we not well question as to why all this is so; and might we not very frequently find that the "trial" is rather on the part of the students in consequence of the fact that he who essays to teach has mistaken his vocation? Thinking, as he no doubt does, that he possesses sufficient knowledge of his subject to teach it, he is still in

complete innocency of his total ignorance regarding the first principles of teaching.

It is a rare gift, that of preparing the common articles of animal food so as to make them acceptable to the general taste; how much more rare might we then reasonably suppose to be the quality of so preparing mental food as to render avidity concomitant with its acceptance! It is a consummation to be desired by many, hoped for by few, and realized only in those designed by nature and prepared by years of study and practice for the accomplishment of this great purpose. Is it to them a "labor of love," an irksome task, a daily trial? Indeed it is not. It is as the gushing forth from the surcharged source of sparkling, cooling water, as the elimination of light and heat from the centre of a solar system, as the droppings from a sanctuary.

Teachings fall pleasantly upon the ear from these, precepts are stored away in cerebral labyrinths, rugged paths in knowledge are shorn of their difficulties, and the crooked is made straight.

Such teachings should be cherished with nurturing care, protected by those who have the capacity to recognize them, and be stimulated to greater excellence through the endeavors of their recipients to bear fruit.

DENTAL SUGGESTIONS.

BY JOHN D. WINGATE.

(Continued from p. 250.)

THE MOUTH MIRROR collects and condenses the vapor of the mouth, which is often very annoying. This is owing to the temperature of the mirror being lower than the atmosphere of the mouth. The same thing will take place if a mirror is transferred from a very cold place to a warm room. *Remedy:* Warm the mirror. This may be done in the hand, but not so well as in warm water, or at a stove. The objection to water is that, unless the mirror is water-tight, the water will get to the silvering and spoil it. Os artificiel would do well to inlay mirrors to make them water-proof.

TO REMOVE TEETH FROM VULCANITE BASE.—Heat the case carefully, either by a lamp or stove; then, having on a pair of gloves, the teeth may be pulled off as easily as from wax. Teeth worn any length of time should be boiled in water with wood ashes or soda, about an hour or two, to dissolve the grease, before resetting.

MENDING OLD PLATE JOBS.—In these the teeth and plates should also be well boiled in ashes and water. In addition to this, Dr. Ely Parry, from whom I learned the plan, also boils the cases in acid. If the grease is not boiled out, a black deposit is sometimes found on the plates and teeth, that is hard to remove, except by re-heating, to a high tempera-

ture, burning it off in this way. Boiling also lessens the danger of cracking the teeth.

"Syrup of the Phosphates."—To find something easily administered, and that will arrest rapid decay, in children's and youth's teeth, has been a desideratum with philanthropic dentists. Having tried the above, I will cite a few cases, with the hope that others may also give it a fair trial.

Case First.—Administered it to my son, aged twelve and a half years. Formerly his teeth were so sensitive that it was with the utmost difficulty they could be filled. Tried to fill, but the pain was excruciating. After taking the syrup in half-teaspoonful doses three times a day a few weeks, the teeth were filled without much trouble. His teeth also look better since.

Case Second.—Gave it in ten-drop doses to another son, aged three years. His teeth were decaying and breaking away rapidly, and the gums much inflamed. In a few weeks his gums appeared healthy, and caries apparently stopped.

Case Third.—A highly respectable young lady, whose teeth were exceedingly sensitive, took teaspoonful doses three times a day for a few weeks; after which she could have fillings inserted without "nervous" spells. She was subject to "nervous headache," which was also fully relieved by the syrup. There is a "Compound Syrup of the Phosphates" which is not so pleasant to take.

Bellefonte, January, 1864.

A STRANGE CASE.

BY CHARLES E. DAVIS.

A physiological curiosity has just come to my knowledge, which I think should be reported, as I do not remember to have read of a similar instance, viz., *a ruminating man.*

Mr. B., of ——, R. I., presented himself for professional services yesterday, and related to me the remarkable fact that all his food, after having been swallowed, was returned to the mouth and was again masticated. This process, after a full meal, requires about four hours to complete. If I understood him aright, all matter in the stomach, not fluid or pulpy, had to be reduced to that condition before it would "stay down," any hard lumps making their presence sensibly felt in the stomach. The process of regurgitation is not under the control of the will at all, is attended by no nausea or disagreeable sensations. The food returned is sweet, and quite as palatable as when first taken from the table.

While in conversation with him, a slight motion of the chest forward, with an upward jerk of the chin, was observed, and mastication quietly

commenced the work of repreparing the day's dinner for digestion. The gentleman, to convince me that he was not imposing on my credulity, took from his mouth what was raised at that time, and showed it to be bits of meat, potatoes, and turnips, being a portion of the meal made from a boiled dinner. The gentleman is about sixty years of age, of a florid complexion, has been generally healthy, and indicates it in his appearance.

If, however, his food don't return for mastication he is invariably made sick.

He cannot remember when he did not ruminate, and always had an uncontrollable habit of eating fast, was often censured for it when a boy, but could not help it.

He has a nephew and a neighbor, both living in the same town, who have this peculiarity. The true ruminantiæ have four stomachs. Is it probable that these individuals are constituted anatomically different from other people?

New Bedford, Mass., Feb. 5, 1864.

PROCEEDINGS OF DENTAL SOCIETIES.

PROCEEDINGS OF THE ODONTOGRAPHIC SOCIETY OF PENNSYLVANIA.

REPORTED FOR THE DENTAL COSMOS BY G. W. ELLIS, M.D.

The Society met in the Philadelphia Dental College on Friday evening, February 5th, 1864, at 8 o'clock, with Prof. Morton acting as President *pro tem.*

Dr. R. Shelton Mackenzie returned thanks for his recent election as an honorary member of the Society, expressed a warm interest in its welfare, and trusted that it might be in his power to do something in its behalf.

Dr. McQuillen said that he was in receipt of letters from several gentlemen, acknowledging their election as members of the Society.

Dr. Flagg then presented the following works to the Society: "Fitch's System of Dental Surgery;" "Bell on the Teeth;" "Odontalgia," by S. Brown; "Harris' Characteristics of the Teeth and Gums;" "Godman's Addresses."

They were received, and a vote of thanks tendered the donor.

The committee on the death of Dr. Leibert made the following report, which was received, and the committee discharged.

Mr. President:—Your committee beg leave to report that they have attended to the duty assigned them, viz.:—

Whereas the members of the Odontographic Society of Pennsylvania have heard, with deep regret, of the decease of their fellow-member, Dr.

H. Leibert, a gentleman who took a warm interest in the establishment and prosperity of this Society,

Resolved, That, falling a victim, as he did, while engaged in scientific investigations, his death is of more than ordinary interest to those who devote their energies in such directions.

Resolved, That in his death the dental profession has lost a valuable and conscientious practitioner, who, when a student, devoted himself assiduously to the study of his profession, with the view of occupying an elevated position in its ranks.

Resolved, That we tender to his bereaved family our sympathies in this their hour of affliction.

Resolved, That a copy of these resolutions be transmitted to the family, and that they be published in the "Transactions."

J. H. McQuillen,
Henry Morton,
Geo. W. Ellis, } *Committee.*

The following paper was then read:—

"NERVOUS AFFECTIONS ORIGINATING FROM DENTAL DISEASE."

BY GEO. W. ELLIS, D.D.S.,

DEMONSTRATOR OF OPERATIVE DENTISTRY IN THE PHILADELPHIA DENTAL COLLEGE.

Gentlemen:—You no doubt recognize the title as embracing an extensive, interesting, and intricate matter, worthy of investigation and promising the searcher after knowledge entertaining and profitable study. I am equally cognizant of its importance, and hence hesitated in adopting it as the subject of my evening's essay, knowing the impossibility of giving it anything more than the most superficial consideration in so limited a space. Yet it is upon such topics that we need enlightenment; and, since this can be obtained in no better way than by a comparison of views in a discussional society, I resolved to start the ball moving, hoping that the efforts to keep it in motion might develop our skill, improve our tactics, and enable us to play a winning game with our subtle adversary.

The most active members of our specialty have long labored to overthrow the barrier which prevented us from assuming control of such systemic difficulties as were clearly referable to a dental origin; their efforts have at length proven successful, and it is a source of gratulation and pride that the unjust imputation upon the ability of our profession is removed, that it is afforded a wider scope for the exercise of its humane and comforting mission, and that it is daily increasing its claims to confidence and respect.

In coming, however, to the subject proper, it is difficult to find the exact starting-point, although, in speaking of nervous affections, a cursory glance at the general anatomical and physiological properties of the nervous system would seem to be eminently proper.

We would notice its division into the cerebro-spinal system, which embraces the brain, spinal cord, and their branching nerves, with their ganglia; and the ganglionic or great sympathetic system, which consists of an intricate network or plexus of nerves, radiating from a chain of ganglia situated along the spinal column, and provided with numerous ganglia throughout their course. The former system presides over the intellect, the special senses, volition, and sensation, and has been termed by Bichat the "nervous system of animal life;" while the latter, from regulating nutrition, secretion, etc., was termed by him, in contradistinction to the former, the "nervous system of organic life." These two systems, however, are not entirely and totally distinct, but frequently join in distribution to the same organs, endowing them with a double nervous influence, so necessary to the proper and uninterrupted performance of their functions; and secures by this intermingling the beautifully concerted and harmonious action of the various organs and tissues which compose the human structure.

The nerves, however, perform widely different offices, and hence have received different and appropriate names. Those constituting the media through which cognizance is taken of impressions upon any of the organs of special sense, have been termed "nerves of special sense;" such as contribute to sensibility are denoted "nerves of common sensation;" such as conduct the motor influence are termed "nerves of motion;" and such as combine the two latter properties are called "mixed nerves." The sentient nerves possess the power of carrying stimulus to a ganglion, where it is converted into motion, and transmitted through motor nerves, either directly to the part from whence the stimulating influence originated, or over an extended surface, according as the producing cause be mild and of short duration, or stronger and more persistent in its application. This constitutes what is known as reflex action, which, in the cerebro-spinal system, is classified by Dalton as follows:—

First. That of the spinal cord, where the nervous impression is conducted directly to that organ, and being there converted into a motor influence, is conveyed to the muscles without any necessary connection with consciousness or will-force. This is termed reflex action *par excellence.*

Second. That in which the impression, passing beyond the spinal cord, reaches the tuber annulare, where it is appreciated by the intellect; the resultant action is voluntary in its character, and follows instantly upon the receipt of the impression without any exercise of the reasoning powers, and hence has been termed *instinctive.*

Third. That in which the impression is carried still further, entering the cerebrum and generating a reasoning process, by which the subsequent action is regulated.

The same author also recognizes three kinds of reflex action, which

occur wholly or partially through the agency of the sympathetic system, and in which the viscera and involuntary muscles are in some way implicated. These are the general anatomical and physiological points in reference to the nervous system, without going into detail; and, thus far, our best authorities are found to very closely coincide. With regard, however, to the nature of "nerve-force," the facts are not so apparent; and the difficulty experienced in solving the mystery is evinced by the conflicting character of results obtained through the accurate and laborious investigations of our best physiologists. For instance: Dalton, in reply to some ingenious statements designed to establish the identity of electricity and nerve-force, makes use of apparently very plausible arguments to show that, although similar in some of their properties, they are widely dissimilar in others, and that the latter force is peculiar to nerve structure, and capable of generation by it alone. On the other hand, the carefully conducted and laborious experiments of Smee demonstrated the existence of an electric current in nerves. Du Bois Reymond obtained like results; when such concurrence in the views of two so reliable authorities enlisted in favor of the electric theory a number of worthy advocates, the detection and analyzation of this powerful, all-important, and lightning-like force would enable us to understandingly combat these trying and excruciatingly painful affections. Although many well-directed and persevering efforts have been baffled, we believe that, from the untiring exertions of those noble devotees of science who are expending life and energies for the benefit of the human family, some good will ultimately accrue, some light be eliminated which will illuminate the obscurity, and enable the professional man to render submissive and docile those nervous diseases which frequently prove so rebellious and persistent.

From this brief description of the nervous organism, it can be readily appreciated how, through the intimate blendings and interchangings of the various filaments, an irritant, applied to one part, can make its effects apparent in another quite remote, either in the form of sensation or motion; and thus, without being guilty of the fault of too many specialists, of attaching an undue importance to the organs with which we have to deal, pathological conditions of the teeth are capable of producing almost any of the nervous disturbances, as manifested in headache, syncope, convulsions, neuralgia, hysteria, epilepsy, tetanus, palsy, insanity, amaurosis, deafness, otalgia, etc.

Philosophers are supposed to be men of judgment and reason; and if

> "There never yet was a philosopher
> Who could endure the *toothache* patiently,"

what is to be expected of less gifted mortals when attacked, not only with this unbearable malady, but simultaneously with one of the concomitants just mentioned? Should we not deeply sympathize with them in such

complicated affliction, and press into the service every palliative and curative likely to minister to comfort and restoration? How many, who are intrusted with the treatment of affections such as those just enumerated, are sufficiently impressed with the importance of the teeth, to attach to them even so much as the shadow of a suspicion, in their search after the exciting cause, rather look everywhere else, and neglect this fruitful source of trouble! When we take into consideration, however, that medical instructors generally regard diseases of the teeth and their treatment as matters of minor importance, it is gratifying to occasionally meet with general practitioners who recognize the systemic disorders as fugitives from the oral Pandora casket, whose precious pearls so often become the germs of evils almost as numerous as that mythological receptacle is supposed to have harbored. To notice some of these ailments, and cite a few illustrative cases, will confirm the agency of the teeth in originating nervous affections.

That which will first receive our attention is cephalalgia, or headache, which is so common an attendant upon toothache that its absence might be regarded an exception. It may exist in any of its various forms, the pain being limited to a small surface, diffused over the entire head, confined superficially, or extended deeply into the brain. Remedies successfully addressed to the offending tooth will mostly result in the simultaneous cessation of the symptomatic pain in the head, although the administration of a narcotic or nervous stimulant, cooling or sedative applications to the head, and the gentle approach to the nostrils of some pungent and stimulating vapor, will prove advantageous adjuncts. Dr. Wood advises, in every case of obstinate cephalalgia of uncertain origin, that particular examination be made into the condition of the teeth, and any one found decayed and tender on pressure, be extracted. He says: "I once had a case of headache, which had continued for two or three months, with varying degrees of violence, and had resisted numerous remedies, which yielded immediately upon the extraction of some decayed teeth." Although we would all heartily indorse the advisability of dental examinations in such cases, there would arise many dissenting voices to the practice of removing all teeth "decayed and tender on pressure."

Another nervous difficulty likely to result from dental irritation is syncope, occasioned mostly by the contact of an instrument with an exposed pulp, cutting upon exquisitely sensitive dentine, the apprehension of a painful operation, or the depression consequent upon its performance, hæmorrhage, etc. I remember the case of a gentleman who applied for an examination of his mouth—the approach of the hand alone, unarmed with an instrument, was sufficient to produce syncope. On recovery, the attempt was renewed, with a like result, until, somewhat mortified, the patient resolved to postpone the operation until some future time, when he hoped to undergo its performance with more fortitude. Some individuals,

from idiosyncrasy, are unduly impressed with the sight of blood, the slightest wound being sufficient to induce an attack of syncope. In such cases as these, however, reaction soon takes place without any interference, yet, from the trouble and detention which they occasion, they prove very undesirable patients, and, fortunately for the operator, very rarely present. When the attack is caused by any acute pain, palliatives should be employed for its mitigation, and means afterward taken to prevent its recurrence; if it be produced by the sensitiveness of an exposed pulp, morphia should be applied, to reduce the sensation, when arsenic, in some form, may be used for its destruction; if from hyper-sensibility of dentine, care should be taken to reduce this before an attempt at excavation. Chloride of zinc is, in the majority of instances, a very reliable agent, although creosote, tannin, chalk, carbonate of ammonia, etc. have each their advocates. When everything else has failed, however, there are still two *reliable* remedies—the performance of the operation under the influence of an anæsthetic, or the application of arsenical paste. When the latter plan is resorted to, care should be exercised, in order to prevent its penetration to a depth sufficient to occasion death of the pulp. Syncope, from any of these causes, demands the same treatment. It is generally sufficient to place the patient in a reclining posture, with the head on a level with, or a little lower than, the rest of the body; loosen all confining articles of dress; apply some pungent volatile liquid to the nostrils; favor reaction by sprinkling cold water upon the surface, friction with coarse towels, slapping, etc. The administration of diffusible stimulants, the application of intense heat to the spine, the use of electricity, etc. are resorted to in extreme cases, such as seldom fall within the province of the dentist.

Convulsions, another form of nervous disorder brought frequently to the notice of the dental practitioner, are limited chiefly to children during the eruption of the temporary teeth, the nervous system being at this period in a peculiarly susceptible and delicate condition. There exists, however, a great difference in the predisposition to such difficulty, one child enduring influences which in another would occasion convulsions of the most alarming character. The gums should be first examined, and if there be indications of an erupting tooth, the part must be freely opened by an incision extending down to the crown; the operation is generally a painless one, and the child once relieved, instinctively covets its repetition at the first indication of a recurrence of the difficulty. When a continuance of the convulsions is threatened after this operation, a pair of blisters, applied behind the ears, is the treatment recommended. Cases, however, demanding general tonic treatment, the employment of antispasmodics, etc., will pass into the hands of the general practitioner. I would mention here that some gentlemen have employed the various phosphates with the most happy results, mitigating the pains of dentition and contributing to a superior quality of tooth structure.

Neuralgia is a subject of special interest to the dentist, and one which merits a lengthy consideration; but the character of this paper forbids anything more than a general review of its nature, in connection with diseases of the teeth. Any pathological condition of these organs is liable to occasion pain in the various nerves distributed over the head and face, which differs in duration, intensity, and extent, according to the same conditions in the exciting cause. Exposure of the pulp to sudden changes of temperature or the contact of foreign bodies, and exostosis, constitute probably the most prolific sources of its excitation. With regard to the peculiar condition of nerve tissue, in cases of persistent neuralgia, very little definite information is possessed; and the many efforts to discover its cause have met with nothing more than the most limited success, some pathologists considering it the result of inflammation of the nerve tissue or neurilemma, while others regard it as exclusively functional in its character. A few years' dental practice will generally serve to bring some cases of this kind to notice; and when the teeth are suspected as the originators of the difficulty, considerable care and discrimination are requisite to fix with certainty upon the offending member. The trouble will sometimes cease upon the correction of the local difficulty, but more frequently a morbid condition of the neighboring nerve tissue is inaugurated, which we are obliged to meet with the various remedies pronounced efficacious in such diseases. The mode of treatment most lauded is the administration of tonics and stimulants, in conjunction with narcotics, which are sometimes absolutely essential, in order to render the pain tolerable. Of the former, the chalybeates are mostly preferred, especially the subcarbonate of iron, combined with some narcotic extract. When there is a periodicity in the paroxysms, they will generally yield to the influence of some of the anti-periodic remedies. During the treatment of facial neuralgia, the employment locally of narcotic remedies, in the form of ointments or washes, will not only diminish the violence of the pain, but will sometimes alone prove curative, probably by enabling the nervous system to recuperate from the debilitated condition occasioned by continued suffering.

Hysteria is another form of nervous disorder, the predisposition to which is supposed to exist in an increased and morbid excitability of the nervous system, the slightest irritating influence being, in many cases, sufficient to provoke all its peculiar phenomena. It is considered by some as strictly a female disorder, having its origin in a disturbance of the uterine system; by others, as traceable to disorder of the brain, etc.; but the best authorities ignore any exclusive theory—discover it in the male as well as female—and attribute it to the general cause just mentioned. I recall a case which occurred in practice several years since. A lady, of hysterical tendency, was undergoing the operation of excavating an upper incisor, previous to filling; the instrument coming in contact with a sen-

sitive surface, gave rise to an attack of the most alarming nature, although the statement of a friend who was present, to the effect that it was nothing unusual, served to allay all apprehension. I am knowing to the case of a lady where the dread of a dental operation is sufficient to occasion a paroxysm.

When a tooth is discovered to be the exciting agent, measures should be taken to correct its condition; and the general nervous irritability must be reduced by tonic treatment, wholesome nutritious diet, exercise in the open air; in other words, the avoidance of everything calculated to reduce the health and strength, and the adoption of all measures expected to impart tone and vigor to the system.

Epilepsy is a nervous disease, supposed to have its origin in a disordered condition of the brain, which renders it very impressible by causes which would otherwise pass unnoticed. This, like the other nervous disorders, may be excited by dental irritation, through the agency of the cerebrum; or such irritation may constitute the primary inducing cause. A case of the latter kind occurred in the past month of November, and was sufficiently marked to merit notice.

Miss M., a young lady aged about twenty years, of nervo-bilious temperament, was seized with violent epileptic convulsions, which continued for a week or more, with such intensity and rapid succession as to seriously threaten dissolution. Her attendant physician, Dr. Hay, suspecting the teeth to be in some manner provocative of the trouble, sent for me to make a dental examination. After a careful search, I discovered an upper molar decayed down even with the gum, and containing a very sensitive fungus pulp. Upon putting some leading questions, I was confirmed in the belief that here was located the cause of trouble. There was, however, upon the same side, a badly decayed bicuspid, with a rapidly developing abscess at the root; and the determination to extract both was the result of a very short deliberation. The patient was accordingly etherized, and both teeth removed. Although during my stay—which did not exceed in all one hour—there were four or five *violent* paroxysms, I have been informed by Dr. H. that immediately after the operation they became less frequent and intense, disappearing altogether in the course of a few days, under the alternate exhibition of quinia, combined with morphia and belladonna.

I am familiar with other cases in which the extraction of the teeth either diminished the frequency of the convulsions, or, as in the case just mentioned, arrested them entirely. One I recall of a young gentleman who was threatened with epilepsy, the tendency to which was entirely removed by the extraction of every alternate tooth, thus withdrawing the pressure occasioned by exostosis. After the removal of the exciting cause, the treatment consists in diminishing the morbid excitability of the brain,

the tonics and narcotics combined constituting the remedies generally employed.

Tetanus and palsy, though almost directly opposite in their peculiar symptoms, are, nevertheless, both inducible by dental irritation, the former being most likely to result from violence done in the operation of extraction. A case is mentioned by Tomes in which it originated from a pivoted tooth; and a short time since I noticed a report stating the death of a child fourteen years of age, from trismus, caused by the continued irritation of decayed teeth. When the slightest tendency toward tetanic rigidity is manifested, active means should be taken to reduce or remove the irritant cause, and some of the narcotics administered, in order to soothe the general irritability of the nervous system; if, however, it become fully developed, opiates, tobacco, etc. must be used, ether or chloroform administered by inhalation, the spine cauterized, and stimulants exhibited when indicated by prostration.

Paralysis sometimes occurs in infants during dentition, and may prove trifling and temporary, or serious and persistent in its effects. When the latter is unfortunately the case, remedies possessing the power of exciting muscular action are mostly relied upon—such as strychnia, ergot, etc., and applications of electricity or galvanism. It may arise in the adult from very trifling causes, upon the removal of which the motor stimulants just mentioned are applicable. The nerves of special sense may become the subjects of paralysis; and amaurosis or blindness, and cophosis or deafness not unfrequently exist as the offspring of dental parentage. I remember a case of amaurosis, which occurred in the practice of a professional friend, where the patient, a lady, had been medicinally treated for some six months, without any improvement, until the discovery—for it was a *discovery*, requiring two or three close examinations for its detection—and removal of portion of necrosed alveolus, an operation followed by a gradual recovery of the lost vision.

Deafness, otalgia, and otorrhœa, either singly or combined, are not unfrequently the result of dental trouble. A case of deafness, with accompanying otorrhœa, came under my notice some time since, in which the removal of a dens sapientiæ, followed by the use of appropriate stimulant and disinfectant injections, speedily effected a cure.

It is unnecessary to multiply further these illustrations, for our dental and medical periodicals contain, in almost every issue, an account of some nervous disorder arising from dental irritation, or a source as little calculated from its extent to generate disorders of such magnitude. It is worthy of mention, however, that diseases of the teeth occasion sympathetic disorder, not only of the nerves of special and general sensation and motion, but occasionally aim directly at the central and controlling organ, the brain, dethroning reason and rendering the unfortunate an object of care and commiseration. A case of this character was re-

ported some time ago, in which a gentleman had been suffering for many years from supposed neuralgia, which finally terminated in insanity; and in this condition he was brought to his dental adviser for the extraction of a tooth. After the application of extraordinary force, the tooth was removed, disclosing an osseous tumor about the size of a filbert, which was growing upon the roots near the crown. The neuralgia ceased, and the patient was soon restored to sanity.

I designed, in treating the subject of this essay, to give it as brief a consideration as possible, yet, even in taking so general a view, the paper has attained to a greater length than I had intended.

In conclusion, I would say that, in connection with cases such as those described, too much stress cannot be laid upon the importance of *thorough* examination and *re*-examination, in order to detect the source of trouble, for the obscurity of the exciting cause is often sufficient to elude the closest scrutiny of the most experienced observer, and call for the expenditure of great skill and patience. With discovery, its removal constitutes the primary step in the treatment; after which the choice of remedial agents must devolve upon the judgment and discrimination of the operator, for the various accompanying peculiarities will determine the most desirable course, while the articles accredited with beneficial qualities are too numerous to admit of specification.

Dr. McQuillen said that, having been informed by the essayist of the evening what would be the subject of his paper, with the view of giving additional interest to the proceedings, he had concluded to present a few physiological experiments in illustration of that portion of the nervous system denominated by Marshall Hall the *true spinal or excito-motor*, and which, either as the result of *centric* or *excentric irritation*, is the agency through which all *convulsive movements* probably are produced. Very decided objections are frequently urged against such experiments on the ground of cruelty to the brute creation. These objections, however, lose their force when taking into consideration that such interrogations of nature have for their object the alleviation of suffering humanity, through the improved modes of treatment attendant upon the acquisition of a more perfect knowledge of the origin and nature of nervous affections. If animals may be destroyed for the sustenance of man, there can be no just cause of complaint against investigations tending to eradicate or remedy some of "the ills which flesh is heir to;" particularly when, by the employment of chloroform or ether, the animals can be rendered insensible during the performance of many of the experiments. Prior to the time of Sir Chas. Bell, the views of physiologists, as is well known, were of the most opposite and contradictory character with regard to the functions of the various portions of the nervous system; but the vivisections of that eminent man, and the subsequent labors of Mayo, Magendie, Hall, Flourens, Longet, Bernard, Brown-Séquard and others

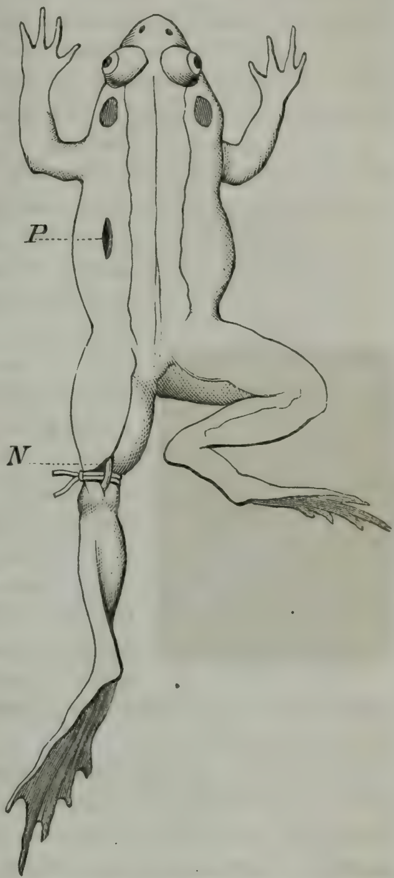
in the same direction, have resulted in the establishment of important and reliable facts, which might be *inferred*, but could not be *definitely settled* in any other manner. Extended and valuable as the results of these investigations unquestionably are, it does not follow that the field is exhausted, or that the repetition of experiments already frequently performed may not eventuate in the discovery of important facts which have escaped the notice of preceding experimenters. Even admitting that such may not be the case, in this day it is not enough for teachers of physiology to detail the observations of others, but they must *experiment* themselves, and *demonstrate their experiments* to those whom they address. It is the recognition of this fact which induced him to work in such directions. The following experiments were then performed with most satisfactory and instructive results:—

First Experiment.—The body of a frog is here presented whose head has just been removed. Now, notwithstanding that physiologists generally agree that sensation is the perception of an impression, and that whatever may be its nature, it requires the intervention of the brain, you will observe on pinching the toes of this brainless animal, or applying nitric acid to the same parts, the extremities are drawn up to the body as if to get away from the source of irritation. Again, on applying the acid to the breast, the upper extremity of the side experimented on is brought toward the part as if with the view of removing the cause of trouble. In analogous experiments on alligators by Dowler, he found the *headless* trunk invariably rolled *away* from *rather* than *toward* the fire, sharp instrument, etc. Results such as these indicate not only the presence of sensibility, but also the capacity or power to act responsive to the stimuli. The spinal cord, as a great ganglionic centre, is the point where such impressions are received through the *sensory* nerves, and from which the motor influence is sent along the *motor nerves* distributed to the muscles. When the manifestation of sensibility, already demonstrated, ceases in response to such stimuli, you observe the electric current induces the most decided spasm. This occurs not merely when the extremities are connected with the trunk, but after a limb, as the one here shown, (fig. 1,) is severed from the body; thus, on applying the current to the *sciatic nerve*, a portion of which has

Fig. 1.

been dissected out, you see the decided and repeated spasms induced; and yet several hours have elapsed since the limb was cut from the body. These spasms demonstrate in a marked degree the *irritability* of the nervous tissue, and that peculiar property of muscular structure denominated *contractility*.

Fig. 2.



Your attention is now invited to an experiment of Cl. Bernard, in which, by the introduction of a poisonous substance placed under the skin, this *contractility* is completely destroyed by acting directly upon the muscular tissue. Here (fig. 2) is a frog in which two hours ago the *sciatic* nerve, N, was exposed in the back part of the left thigh, and a ligature passed underneath it and tied tightly around the limb so as to cut off the circulation to the lower part. An incision, P, was then made in the skin of the back, and a solution of the poison sulpho-cyanide of potassium introduced; this has been absorbed by the capillaries and carried by the circulation to every part of the body but the limb around which the ligature was placed. It has destroyed the life of the animal, and you observe on applying the galvanic current that no movement occurs in the parts to which the poison has been carried; an active contraction, however, takes place in the limb unaffected by the sulpho-cyanide of potassium. Bernard and others infer from this experiment, that while the muscles of the poisoned limbs lose their *contractility*, the nerves of the same part retain their *irritability*.

It is asserted by the same authority, Bernard, that when woorara (a poison used by the South American Indians) is applied to a frog prepared like the one just presented, no reflex action can be induced after death in the poisoned limbs, but that spasmodic action will occur beyond the ligated part. This substance is said to destroy the *irritability* of the *motor nerves* without affecting that of the muscles, and in this way the absence of contractility is accounted for. He had experi-

mented to some extent with this article, but did not feel prepared to confirm or disprove the statement by his own observations.

Here is a third frog, however, which has been destroyed by some woorara obtained from a reliable source, and yet you will observe that marked spasms of the body and *all* the extremities occur on applying the *induced electric* current. He did not consider this sufficient, although it is the second time that the same result had supervened in his hands, to assert that the poison has been credited with properties which it does not possess, but, on the contrary, was disposed to believe that there might be something wrong in the article used or its management.

In the course of the preceding experiments, it has been observed that the spinal cord is a great centre with an inherent motory power, which it communicates to its nerves independent of the brain. In a healthy condition the limbs of the human body give very little evidence of a disposition to reflex movements, as they are restrained by the controlling influence of the brain. But when, as the result of *centric* or *excentric irritation*, the spinal cord is in a state of unnatural excitability, (as in hysteria, chorea, epilepsy, etc.,) the uncontrollable reflex movements of the limbs are marked characteristics of these affections. Diseased teeth not unfrequently serve as *excentric* or peripheral sources of irritation in arousing such manifestations. Under such circumstances, the impression made upon the peripheral extremities of the fifth pair of nerves is conveyed to the medulla oblongata, and the train of phenomena is awakened by the impulse sent along the anterior or motor roots of the nerves issuing from the spinal cord and distributed to the muscles. (Fig. 3.)

Fig. 3.

Prof. Morton said, the dispute regarding the relation of vital or nerve force and galvanism may, perhaps, be reconciled, if we allow a very close connection to exist between them without maintaining their absolute identity. Such a connection, for example, as exists between light and heat. Light being only rapidly vibrating heat, heat slowly vibrating light; light convertible into heat, heat into light, the same source often evolving both; the same body often transmitting both, yet again refusing to carry one and yet carrying the other, as in the case of rock salt, which transmits heat and light equally well from all sources, and glass, which allows *intense* heat only to pass, as that of the sun, absorbing more diffused or *lower-toned* heat, like that from a fire. So we may suppose that nerve aud galvanic force are as intimately connected, reciprocally convertible, and often combined, yet separable, and sometimes not equally transmissible by certain structures.

Dr. Gorges said he fully indorsed what Dr. Ellis enunciated in his paper, in regard to systemic trouble induced through morbid conditions of the dental organs. He cited a case that recently occurred in his practice, in the person of a gentleman of nervo-sanguine temperament. On examining a superior canine tooth, much decayed, the dental pulp was found fully exposed; it had not ached for some time, which led him to believe the nerve devitalized. On introducing a fine instrument into the pulp chamber there was no exhibition of pain; but in withdrawing the instrument, he discovered him to be in a fainting condition from the pallor of his face, which was immediately followed by complete syncope. By the application of volatile stimulants to the nose, he very soon recovered. On being asked where he had been, he said he had been to the home of his childhood, in England, and inquired what I had given him—chloroform or ether?—being greatly surprised when told that I had not administered either. What was singular, no very great pain was experienced in the tooth; but the small quantity of blood that followed his return to consciousness was sufficient indication that the nerve was not devitalized.

Adjourned.

BROOKLYN DENTAL ASSOCIATION.

BY THOS. BURGH, D.D.S.

A MEETING of this Association was held January 6th, 1864, Dr. Parks in the Chair, when the following subject was discussed: "The Best Treatment of Sensitive Dentine."

Dr. Fitch said that the subject was quite an extended one. To understand it, and meet its indications with appropriate medication, require a knowledge of the basal principles underlying all pathology. Could we look into the organism and detect the incipiency of this disease, we should most likely find its origin in the perversion or disturbance of vital force. We often meet with cases where the exposed surfaces of the dentine become rapidly and exquisitely sensitive. With proper treatment, the sensitiveness quickly disappears. Intensified states of mind, no doubt, have much to do in producing this condition. Irritable conditions of the general system often produce it. Anxiety, fear, pain, anger, joy, if persistent and intensified, may also produce it. We should recognize these mental and moral as well as physical conditions, and treat them. Instanced a case of very sensitive dentine, where he prescribed chlorate of potassæ, and afterward the syrup of phosphates of iron, lime, etc., and in a few days this condition was entirely changed. In such cases topical treatment would not do; and yet at times topical treatment is urgently called for.

Dr. Mills, in his early practice, treated sensitive dentine with arsenical

paste and creosote entirely. Does not now use it exclusively, but resorts to other treatment. Has found in cases of quick decay, of the leathery condition, that, after the first layer is removed, little if any sensitiveness remains. Sometimes employs creosote, and has lately used creosote and camphor with some success; but would especially recommend *patience*, *perseverance*, and *kindness*. Mentioned a case in point. The moment he commenced to excavate, the patient would go almost into spasms. Spent an hour and a half without any progress; but in other sittings succeeded, and filled several teeth. Attributed his success to kindness and the quick use of sharp instruments. Makes a practice with children of getting acquainted at the first sitting, and doing but little; and thus inspires confidence. Does not think that this condition always requires pathological treatment.

Dr. A. C. Hawes believed sensitive dentine more likely to be induced by an acrid state of the mouth than by any other cause. Frequently employs an alkaline wash. Thinks simple lime-water may be used to great advantage, more especially where some general derangement has caused that extreme sensitiveness at the juncture of the enamel and cement, so often presented for treatment, and in sound and apparently healthy teeth. Finds supercarbonate of soda produces happy results as often as anything. Fills the cavity with the dry soda, allowing it to remain a few minutes; and thinks that there is always an excess of acid wherever sensitive dentine is found. A remedy may be quite successful with one patient, and fail to benefit the next. Considered *all* the popular remedies unreliable; and was of the opinion that by gentleness, patience, and perseverance, intelligently directed, we were more likely to overcome the difficulty than by any other known means. Never employs arsenic for this purpose, because of danger to the pulp.

Dr. Francis considered none of the various theories of this condition of the teeth perfectly satisfactory. Had used chloride of zinc, but with little success. Frequently uses creosote and tannin; also arsenic, in *very minute* quantities, combined with creosote and tannin, for superficial cavities. Has never observed any ill result from his method of using it; but its use requires discretion. Allows it to remain in the cavity one or two days, according to circumstances. Deep cavities he frequently fills with a temporary plug, to remain several weeks or months. Thinks the sensitiveness diminished thereby.

Dr. Atkinson said, it is evident we do not *know* much about this matter. There can be no two theories, properly called; there is but one principle to which to refer facts of practice for elucidation. Facts of practice only prove which is theory and which speculation. All successful practitioners have pet methods and remedies which seem to readily obey their wills. Earnestness so concentrates the magnetic force of the operator as to subdue the sensibilities of the patient, even against methods in themselves objectionable. The true cause of sensitive dentine is the simulation

of nerve by the softened dentinal tubes, enabling them to vicariously perform the function of nerve proper in carrying the vibration to the seat of the sentiency. Dr. Mills displaced the magnetism of his patient by his earnestness to do the work without pain, thus substituting his own magnetism, which would not convey the impression made upon the softened dentine.

The cause of sensitive dentine in cases of living pulp—where alone it properly occurs—is thus explained, viz.: the softened tubules are collapsed against their contents, forcing the fluid down against the pulp at the open ends of the tubes, thus impinging upon the neural sea in the body of the pulp, which must be in the state of irritation to be made uncomfortable thereby. There is a condition opposite to irritation, which he would call depolarization of the nerve in the pulp of the teeth. When in this state the dentine is not sensitive; neither is the pulp itself, as has often been proved, where the cornuæ of pulps have been cut off, bleeding freely without the patient being aware of it.

Wedging, when properly done, enables one to excavate, without pain, teeth that were exquisitely sensitive before the wedges produced the necessary tension of pulp and periosteum.

Many astringents (oxides) act upon the deoxidized dentine, and thus prevent tenderness, or restore to a tolerant condition that which was intolerant of interference. Arsenical preparations are prompt to act in this way, enabling us to cut with impunity after twenty-four hours' contact of this agent. Was not discussing *normal* sensitiveness. All dentine in the formative stages, *i.e.* before complete calcification, is more or less sensitive, according to the degree of hardness or closure of the tubules. The very best dentine, when under deoxidizing influences, is most exquisitely sensitive, so long as the tubules remain pervious to the plasm containing the sea of nerve aura. Chloride of zinc, caustic potash, etc. act upon this plasm and deprive it of its conducting power, somewhat in the manner of arsenic, and in identical concord of principles. His best advice is to carefully observe and secure compatibility between yourself and patient; and if, after that is secured, local or constitutional treatment is required, administer it. Aplastic conditions of the blood are readily corrected by the administration of full doses of muriated tincture of iron. Two or three days will be sufficient to change the atonic to a tonic state. Tonic means polarization of the globules of blood and lymph.

Good, hard teeth are sensitive in both acid and alkaline mouths; but there are few alkaline mouths in this country. Would use wedges in all approximal cavities.

Dr. W. H. Allen felt that the subject was of much importance to both operator and patient. Was deeply interested in the cause as well as its proper treatment. The former he would leave, at present, to his theoretic friends, hoping that we should soon know more of it than we do now. Thinks well of the method recommended by Dr. Mills. Has em-

ployed both the quieting and heroic methods—they work well together. Get acquainted with, and secure the confidence of your patient, and then, with strong and sharp instruments, excavate as quickly as possible. In using chloride of zinc he has generally found "the remedy worse than the disease." Has been more successful in the use of arsenic than anything else; uses it in the form of a paste, with acetate of morphia and creosote, but with great care, and never in the mouths of children, or when the decay extends near the pulp. Leaves it in five or six hours, and thinks no bad effects will follow its proper use. After cleansing a cavity for a plug, never let the patient go away without filling it with something to keep out the air and moisture, as it will become more sensitive if left exposed. Hopes all will experiment in this direction, and thinks we may ultimately find something to benefit this condition. Supposed wedging acted as a diversion.

Dr. H. Abbot suggested a mixture of one part chloride of zinc and two parts chloroform. Found it a very good remedy, and less painful than chloride of zinc alone.

Dr. Atkinson thought the specific effect of chloride of zinc not obtainable in chloroform. If this mixture had any good effect it was attributable to the chloroform, as chloride of zinc is not soluble in it, because the affinity for chlorine in the zinc is satisfied.

Dr. Burras came with what he supposed to be a theory, but finds, from the arguments of gentlemen, that it is all speculation. Knows nothing of the cause of sensitive dentine, but treats the effect as found—always by the use of the most reliable antacids, and drying the cavity before excavating. Even excluding the moisture for a time is generally followed by a subsidence of sensibility. Finds the peculiar white decay always the most sensitive, and concludes it to be mostly electrical; for, when the polarity of the structure is changed, or on exposure of the nerve, the dentine loses its sensibility. Does not consider dental caries a disease, but a dissolution of continuity from chemical action, by the abstraction of the phosphate of lime from the tooth substance.

Dr. Roy has tried chloride of zinc and creosote, and finds it less painful than chloride of zinc alone. Sometimes leaves it in twenty-four hours, and often in one tooth while excavating another. But prefers Dr. Mills' method.

Dr. Clowes, before his acquaintance with this Society, used no external sedative application. For over twenty years he had managed to get along very well without. With *adult* patients his sheet-anchor is keeping cool. Has had patients so nervous that they could hardly be kept in the chair; and yet, by coolness and firm will, they were anæsthetized and magnetized to an extent which allowed him to excavate the most sensitive cavities with very little apparent pain. One patient had been to another dentist, who was so sensitive to the pain attending his operations, that he had to

absent himself for awhile to rouse his courage to renew his work. On returning to the room, his pale-facedness was remarked, and, as like begets like, the faint-heartedness was communicated to the patient, and the work to be done went by default. Before performing any serious operation, he considered a little *encouraging talk* with the patient essential. He inculcates the doctrine of a "stout heart and steady hand," promising to be true with the hand if the patient will have faith and nerve the heart. The case just cited was a fine illustration of his plan. A faint heart and unsteady hand had sent the patient away unrelieved and frightened; and she was not able for several years to acquire courage to try again. But having come under his care, he inspired her with confidence; and of all the patients he ever had, she was the bravest, for from morning till evening she was an uncomplaining occupant of his chair.

With children he finds little difficulty; they are among his *very best* patients in endurance and appreciation. He "talks" to them also, but in a way appropriate to childhood. Explains what he is about to do, and gets them to look in a glass and see for themselves. Calls to their thought the present pain, the unclean cavity, the bad breath, and promises to change all this. Having interested them and aroused their ambition, he proceeds to work. Cutting cautiously, he watches the play of expression on the features, and learns from it when to speak and how to act. The child's endurance may be increased by a story of some other child who was heroic under like circumstances.

He has used chloride of zinc, and sometimes found it useful, especially in approximal cavities of the front teeth; but considers kindness and carefulness the best remedy.

Dr. Scott said, if he finds the tooth sensitive under the enamel, he is sure the nerve is not exposed. He then excavates the centre first, and works toward the enamel quickly, as the best means of relieving the sensitiveness.

Dr. Crowell knew as much about sensitive dentine eighteen years ago as now seems to be known. Once put some potassæ in a man's tooth, which made him crazy, and he rewarded the doctor with a belligerent demonstration for his pains. His treatment of sensitive dentine was to cut it strongly and firmly with sharp instruments. Warmly recommended jeweler's pinion wire for excavators. It made the best he had ever used.

Dr. Hurd is much perplexed over this condition of the teeth. Finds it in every class of mouth. Arsenic is a good remedy, especially in children's teeth; but likes kindness best. Does not believe in mesmerism, galvanism, etc. Thinks story-telling over-estimated.

Other speakers addressed the meeting, recommending the different remedies mentioned above; but generally concurred in commending kindness, vigor, and sharp instruments as the first and last resort.

DEATH OF DR. W. C. PLATT.

The following is the adopted report of a committee appointed by the unanimous vote of the Brooklyn Dental Association for that purpose:—

It hath pleased Almighty God, in the plenitude of his wisdom, to remove, by sudden death, W. C. Platt, Dentist, of our city. Dr. Platt died on the morning of November 7th, 1863, of inflammation of the brain, after four days' illness, aged twenty-eight.

The funeral services were attended at St. Thomas' Church, and his remains lie now entombed in Greenwood. "*Pax te cum.*"

In the death of Dr. Platt the dental profession has lost an earnest and faithful member. He had few if any superiors in operative dentistry. In the morning of life, and possessed of unusual physical powers, a long career of professional usefulness seemed almost certain. But, "Thou hast all seasons for thine own, oh! Death." Dr. P. passed his novitiate in the office of Drs. Foster and Blakesly, Utica, N. Y. Choosing New York City as a field of dental effort, he entered upon professional duties some time in the year 1858. His professional life has been short, but a success. A stranger from home and country, he drew around him a large circle of devoted friends, among whom were numbered some of the first families of our city. All who knew him loved him for his frank and noble manliness, being generous to a fault, genial in spirit, earnest, firm, and honest in purpose; possessed of more than ordinary mechanical ability, coupled with a fair share of intellectual culture.

Dr. Platt leaves an aged, widowed, and now childless mother in Nassau, N. P.

Whereas, while in view of this deeply afflictive and unlooked-for Providence, we bow with humble submission,

Resolved, That we deeply sympathize with the bereaved and heart-stricken mother, who doubtless watched with anxiety and pride the manly efforts of her only son in a distant city. Conscious of the insufficiency of human sympathy to afford relief in such an affliction, we most earnestly commend her to the protection and succor of that Heavenly Friend that sticketh closer than a brother, and that doeth all things well.

Resolved, That the foregoing be published in one of our dental periodicals and in one of the leading city journals, and a copy of the same be forwarded to his mother, at Nassau, N. P.

W. H. Atkinson, *Chairman of Committee.*

CHICAGO DENTAL SOCIETY.

BY E. W. SAWYER.

Knowing that the readers of the Dental Cosmos will be glad to hear of anything relating to the progress of our profession in this city, we are pleased to be able to tell you that on February the 8th inst., the following named gentlemen organized the "Chicago Dental Society," by adopting a constitution and by-laws, and electing temporary officers to hold until the next regular meeting in April: Dr. E. W. Hadley, John C. Fuller, James C. Dean, W. W. Allport, Wm. Albaugh, Geo. H. Cushing, E. W. Sawyer, J. H. Young, L. P. Haskell, S. B. Noble, L. Bush, and J Ward Ellis.

Dr. S. S. White and S. R. Bingham were elected honorary members. We were favored by the presence of Dr. White, who addressed us happily and encouragingly, and generously laid the foundation of our dental library by donating a full set of the *Dental News Letter* and Dental Cosmos.

AMERICAN DENTAL CONVENTION.

The Tenth Annual Session will be held at Detroit, Michigan, commencing Tuesday, August 2d, 1864.

ORDER OF BUSINESS.

1. Reading the Constitution, and Admission of Members.
2. Reading the Minutes of last Convention.
3. Reports of Officers and Standing Committees.
4. Election of Officers.
5. Retiring President's Address.
6. Induction of Officers.
7. Reports of Special Committees.
8. Miscellaneous Business.

ORDER OF DISCUSSION.

1. The best means of improving the practice and elevating the profession of Dentistry.

2. Anæsthetics—their proper use and relative value.

3. Extracting teeth: when it should be done and when not,—the best instruments for the purpose, and the subsequent treatment, when any is required.

4. Absorption of alveolar process—causes and treatment.

5. Filling teeth: The relative value of different materials, and the mode of operating in difficult cases.

6. The best mode of obtaining accurate impressions and models of the mouth.

7. The relative value of different materials as a base for artificial teeth.

8. Miscellaneous.

All written communications must be read to open the discussion of the subjects to which they relate, and must not occupy more than fifteen minutes in the reading.

No member shall speak more than ten minutes at one time, nor more than twice on the same subject, without the unanimous consent of the Convention.

The subjects selected for discussion are unusually practical, and are designed to elicit the results of actual experience and observation, rather than theories and speculations, which are better for the seclusion of the study than for public assemblies.

All Dentists in regular practice may become members of the Convention, and all such are hereby invited to attend.

L. W. Rogers, Utica, N. Y.,	*Executive Committee.*
A. W. Kingsley, Elizabeth, N. J.,	
J. A. Watling, Ypsilanti, Mich.,	
A. Hill, Norwalk, Conn.,	
H. A. Smith, Cincinnati, Ohio,	

REVIEW OF DENTAL LITERATURE AND ART.

BY J. H. M'QUILLEN, D.D.S.,

PROFESSOR OF ANATOMY, PHYSIOLOGY, AND HYGIENE IN THE PHILADELPHIA DENTAL COLLEGE.

Heat considered as a Mode of Motion. By John Tyndale, F.R.S., Professor of Natural Philosophy in the Royal Institution.—A work bearing the above title is one of the most attractive and instructive scientific books published for some time past, and a careful perusal of its contents has induced a desire on my part to hear of its being in the hands of every member of the profession who is animated by the determination to become acquainted, at least in a general manner, with the advances made in the various departments of science.

The subject is interesting to every one on account of its practical bearings; and the aim of the author, as he states in his preface, has been to rise to the level of the questions discussed from a basis so elementary that a person possessing any imaginative faculty and power of concentration might accompany him.

The theory which the author eloquently and powerfully advocates, and demonstrates by many novel and interesting experiments, is that first ad-

vanced by Count Rumford, and ably supported by Sir Humphrey Davy, that *heat* is a kind of molecular motion, and that by friction, percussion, or compression this motion may be generated as well as by combustion.

The admirable summary of the influence exerted by the sun on the organic world, vegetable and animal, claims special attention on account of the graphic and pleasing manner in which the *facts* are presented.

In this connection it may not be amiss to state that closely confined as the dentist is, by his duties, to the office, during the day, he fails to secure not only the invigorating influence of the fresh air, but also that which is equally important, the stimulating effects of the direct rays of the sun; for exposure to each of these during a number of hours each day is necessary for the full development and maintenance of his physical and mental powers. It is not enough to walk out in the fresh air; but that which the many almost invariably avoid, the sunny side of the way, should be selected so that the solar rays may fall directly upon the face and entire person. Every one is familiar with the etiolated or blanched appearance presented by plants when deprived of light. The same unnatural result is also presented in man when secluded from the direct influence of the sun, and the pale and sickly characteristics of the exterior, under such circumstances, afford, as a general thing, a fair indication that the vital powers of the organism are very much depressed.

The following extracts from the work are presented with the view of awakening a desire for a more extended acquaintance with it.

"The heat emitted by the sun, if used to melt a stratum of ice applied to the sun's surface, would liquefy the ice at the rate of 2400 feet an hour. It would boil, per hour, 700,000 millions of cubic miles of ice-cold water. Expressed in another form, the heat given out by the sun, per hour, is equal to that which would be generated by the combustion of a layer of solid coal, 10 feet thick, entirely surrounding the sun; hence, the heat emitted in a year is equal to that which would be produced by the combustion of a layer of coal 17 miles in thickness.

"These are the results of direct measurement; and should greater accuracy be conferred on them by future determinations, it will not deprive them of their astounding character. And this expenditure has been going on for ages, without our being able, in historic times, to detect the loss.

"How is the perennial loss of the sun made good? We are apt to overlook the wonderful in the common. Possibly to many of us—and even to some of the most enlightened among us—the sun appears as a fire, differing from our terrestrial fires only in the magnitude and intensity of its combustion. But what is the burning matter which can thus maintain itself? All that we know of cosmical phenomena declares our brotherhood with the sun—affirms that the same constituents enter into the composition of his mass as those already known to chemistry. But no earthly substance with which we are acquainted—no substance which the fall of meteors has landed on the earth—would be at all competent to maintain the sun's combustion. The chemical energy of such substances would be too weak, and their dissipation would be too speedy.

Were the sun a solid block of coal, and were it allowed a sufficient supply of oxygen, to enable it to burn at the rate necessary to produce the observed emission, it would be utterly consumed in 5000 years. On the other hand, to imagine it a body originally endowed with a store of heat —a hot globe now cooling—necessitates the ascription to it of qualities wholly different from those possessed by terrestrial matter. If we knew the specific heat of the sun, we could calculate its rate of cooling. Assuming this to be the same as that of water,—the terrestrial substance which possesses the highest specific heat,—at its present rate of emission, the entire mass of the sun would cool down 15,000° Faht. in 5000 years. In short, if the sun be formed of matter like our own, some means must exist of restoring to him his wasted power.

"The facts are so extraordinary, that the soberest hypothesis regarding them must appear wild. The sun, we know, rotates upon his axis; he turns like a wheel once in about 25 days; can it be the friction of the periphery of this wheel against something in surrounding space which produces the light and heat? Such a notion has been entertained. But what forms the brake, and by what agency is it held, while it rubs against the sun? The action is inconceivable; but, granting the existence of the brake, we can calculate the total amount of heat which the sun could generate by such friction. We know his mass, we know his time of rotation; we know the mechanical equivalent of heat; and from these data we deduce, with certainty, that the entire force of rotation, if converted into heat, would cover more than one, but less than two centuries of emission. There is no hypothesis involved in this calculation.

"There is another theory, which, however bold it may, at first sight, appear, deserves our earnest attention. I have already referred to it as the Meteoric Theory of the sun's heat. Solar space is peopled with ponderable objects. Kepler's celebrated statement that 'there are more comets in the heavens than fish in the ocean,' refers to the fact that a small portion only of the total number of comets belonging to our system is seen from the earth. But, besides comets, and planets, and moons, a numerous class of bodies belong to our system,—asteroids, which, from their smallness, might be regarded as cosmical atoms. Like the planets and the comets, these smaller bodies obey the law of gravity, and revolve on elliptical orbits around the sun; and it is they, when they come within the earth's atmosphere, that, fired by friction, appear to us as meteors and falling stars.

"On a bright night, 20 minutes rarely pass at any part of the earth's surface, without the appearance of at least one meteor. At certain times, (the 12th of August and the 14th of November,) they appear in enormous numbers. During nine hours of observation in Boston, when they were described as falling as thick as snowflakes, 240,000 meteors were calculated to have been observed. The number falling in a year might, perhaps, be estimated at hundreds or thousands of millions, and even these would constitute but a small portion of the total number of asteroids that circulate round the sun. From the phenomena of light and heat, and by the direct observations of Encke on his comet, we learn that the universe is filled by a resisting medium, through the friction of which all the masses of our system are drawn gradually toward the sun. And though the larger planets show in historic times no diminution of their periods of revolution, this may not hold good for the smaller bodies. In the time required for the mean distance of the earth from the sun to

alter a single yard, a small asteroid may have approached thousands of miles nearer to our central luminary.

"Following up these reflections, we should infer that while this immeasurable stream of ponderable matter rolls unceasingly toward the sun, it must augment in density as it approaches its centre of convergence. And here the conjecture naturally rises, that that weak nebulous light, of vast dimensions, which embraces the sun — the zodiacal light — may owe its existence to these crowded meteoric masses. However this may be, it is at least proved that this luminous phenomenon arises from matter which circulates in obedience to planetary laws; the entire mass constituting the zodiacal light must be constantly approaching, and incessantly raining its substance down upon the sun.

"We observe the fall of an apple, and investigate the law which rules its motion. In the place of the earth we set the sun, and in the place of the apple we set the earth, and thus possess ourselves of the key to the mechanics of the heavens. We know the connection between height of fall, velocity, and heat of the surface of the earth. In the place of the earth let us set the sun, with 300,000 times the earth's mass, and, instead of a fall of a few feet, let us take cosmical elevations; we thus obtain a means of generating heat which transcends all terrestrial power.

"It is easy to calculate both the maximum and the minimum velocity imparted by the sun's attraction to an asteroid circulating round him; the maximum is generated when the body approaches the sun from an infinite distance; the *entire hull* of the sun being then expended upon it; the minimum is that velocity which would barely enable the body to revolve round the sun close to his surface. The final velocity of the former, just before striking the sun, would be 390 miles a second, that of the latter 276 miles a second. The asteroid, on striking the snu with the former velocity, would develop more than 9000 times the heat generated by the combustion of upwards of 4000 such asteroids. It matters not, therefore, whether the substances falling into the sun be combustible or not; their being combustible would not add sensibly to the tremendous heat produced by their mechanical collision.

"Here then we have an agency competent to restore his lost energy to the sun, and to maintain a temperature at his surface which transcends all terrestrial combustion. The very quality of the solar rays—their incomparable penetrative power—enables us to infer that the temperature of their origin must be enormous; but in the fall of asteroids we find the means of producing such a temperature. It may be contended that this showering down of matter must be accompanied by the growth of the sun in size; it is so; but the quantity necessary to produce the observed calorific emission, even if accumulated for 4000 years, would defeat the scrutiny of our best instruments. If the earth struck the sun if would utterly vanish from perception, but the heat developed by its shock would cover the expenditure of the sun for a century.

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"Grand, however, and marvelous as are those questions regarding the physical constitution of the sun, they are but a portion of the wonders connected with our luminary. His relationship to life is yet to be referred to. The earth's atmosphere contains carbonic acid, and the earth's surface bears living plants; the former is the nutriment of the latter. The plant apparently seizes the combined carbon and oxygen; tears them

asunder, storing up the carbon and letting the oxygen go free. By no special force, different in quality from other forces, do plants exercise this power,—the real magician here is the sun. We have seen in former lectures how heat is consumed in forcing asunder the atoms and molecules of solids and liquids, converting itself into potential energy, which reappeared as heat, when the attractions of the separated atoms were again allowed to come into play. Precisely the same considerations which we then applied to heat we have now to apply to light; for it is at the expense of the solar light that the decomposition of the carbonic acid is effected. Without the sun the reduction cannot take place, and an amount of sunlight is consumed exactly equivalent to the molecular work accomplished. Thus trees are formed, thus the meadows grow, thus the flowers bloom. Let the solar rays fall upon a surface of sand, the sand is heated and finally radiates away as much as it receives; let the same rays fall upon a forest, the quantity of heat given back is less than that received, for the energy of a portion of the sumbeams is invested in the building of the trees. I have here a bundle of cotton, which I ignite; it bursts into flame and yields a definite amount of heat; precisely that amount of heat was abstracted from the sun, in order to form that bit of cotton. This is a representative case;—every tree, plant, and flower grows and flourishes by the grace and bounty of the sun.

"But we cannot stop at vegetable life; for this is the source, mediate or immediate, of all animal life. In the animal body vegetable substances are brought again into contact with their beloved oxygen, and they burn within us, as a fire burns in a grate. This is the source of all animal power; and the forces in play are the same, in kind, as those which operate in organic nature. In the plant the clock is wound up, in the animal it runs down. In the plant the atoms are separated, in the animal they recombine. And as surely as the force which moves a clock's hands is derived from the arm which winds up the clock, so surely is all terrestrial power drawn from the sun. Leaving out of account the eruptions of volcanoes, and the ebb and flow of the tides, every mechanical action on the earth's surface, every manifestation of power, organic and inorganic, vital and physical, is produced by the sun. His warmth keeps the sea liquid, and the atmosphere a gas, and all the storms which agitate both are blown by the mechanical action of the sun. He lifts the rivers and the glaciers up to the mountains; and thus the cataract and the avalanche shoot with an energy derived immediately from him. Thunder and lightning are also his transmuted strength. Every fire that burns and every flame that glows, dispenses light and heat which originally belonged to the sun. In these days, unhappily, the news of battle is familiar to us, but every shock, and every charge, is an application, or misapplication, of the mechanical force of the sun. He blows the trumpet, he urges the projectile, he bursts the bomb. And remember, this is not poetry, but rigid mechanical truth. He rears, as I have said, the whole vegetable world, and through it the animal; the lilies of the field are his workmanship, the verdure of the meadows, and the cattle upon a thousand hills. He forms the muscle, he urges the blood, and builds the brain. His fleetness is in the lion's foot; he springs in the panther, he soars in the eagle, he glides in the snake. He builds the forest, and hews it down; the power which raised the tree and which wields the axe being one and the same. The clover sprouts and blossoms, and the scythe of

the mower swings by the operation of the same force. The sun digs the ore from our mines; he rolls the iron; he rivets the plates; he boils the water; he draws the train. He not only grows the cotton, but he spins the fibre, and weaves the web. There is not a hammer raised, a wheel turned, or a shuttle thrown, that is not raised, and turned, and thrown by the sun. His energy is poured freely into space, but our world is a halting place where his energy is conditioned. Here the Proteus works his spells; the self-same essence takes a million shapes and hues, and finally dissolves into its primitive and almost formless form. The sun comes to us as heat; he quits us as heat; and between his entrance and departure, the multiform powers of our globe appear. They are all special forms of solar power,—the moulds into which his strength is temporarily poured, in passing from its source through infinitude."

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The Philadelphia Photographer, published by Benerman & Wilson, Philadelphia.—The second number of this magazine, with a spirited photograph of "Happy as a King," by Gutekunst, has been received, and is a decided improvement on the first. One of the articles is a sensible and plainly written communication, by Mr. Coleman Sellers, embodying a description, which the wayfarer though a fool might understand, of the different stages of making a negative picture. This is one of a series of papers by the same author, who informed me recently that he contemplates publishing a work on this department of art, written in the same style. There is so much of science connected with photography, (optics, chemistry, etc.,) and so many directions in which it has been and still may be applied, that the table of contents of a journal devoted, as this is, to the specialty, should present each month a list of articles calculated to interest and instruct not only the professional and amateur photographist, but the reading public in general.

One of the most important directions in which photography can be employed is in illustrations of anatomical and pathological conditions. Although something has been done in this way, the results as yet have been of the most limited and circumscribed character. Illustrations of this kind, on account of their faithful portraiture, would frequently prove invaluable to the physician, surgeon, and dentist, as aids in diagnosis, and in cases of consultation when the parties reside at a distance from each other. It is interesting also to have at hand, as a matter of reference, cases where one's opinion has been requested, or in which certain operations have been performed, showing the condition of parts prior to and after the operation. The many affections of the jaws, and soft parts of the face, in particular offer a good field for work. In a case of hypertrophy of the lower jaw, recently sent to me in consultation, the patient willingly complied with the request for a photograph showing the external peculiarities of his affection.

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PHILADELPHIA SCHOOL OF ANATOMY, College Avenue, Tenth Street, above Chestnut.—Dr. James E. Garretson will commence the regular Summer course of lectures on Anatomy in this institution on the first Monday in April. The character of the lectures and the means of illustration are so well known as not to demand comment.

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THE LONDON DENTAL REVIEW—JANUARY, 1864.

THE following was presented in the *Dental Review*, in connection with the case reported in the DENTAL COSMOS for November, as occurring in my practice:—

"INFLAMMATION AND PARTIAL ABSORPTION OF THE FANG OF A SECOND UPPER MOLAR TOOTH PRODUCED BY THE ERUPTION OF THE WISDOM TOOTH. By ROBERT T. HULME, M.R.C.S.E., F.L S.—A gentleman's servant was sent to me on account of pain in the second molar on the right side of the upper jaw. The man was between thirty and forty years of age. The mouth was small, but the teeth not crowded. On examining the tooth, it was, to all external appearances, perfectly sound; that as there was no evidence of decay existing in any part of the crown, but the tooth was loose and tender to the touch. I found that neither of the wisdom teeth in the upper jaw had been erupted; at the same time there was sufficient space left for their reception at the back of the jaw. The patient informed me he had been suffering, on and off, from pain in the second molar, for more than a fortnight, and that latterly it had increased to a considerable degree. He was unable to eat on that side of the mouth; and the constant annoyance which he suffered from the tooth rendered it very irksome to him to attend to his duties.

"Although I could perceive no evidence of the wisdom tooth making its appearance, yet I strongly suspected that it was in some way connected with the inflammation, which was clearly existing in the periosteum of the fangs of the diseased tooth. Under these circumstances, I considered there could be but little use in attempting to subdue the inflammation by local treatment, and therefore recommended the extraction of the tooth. This was easily accomplished; and on examining the tooth, I found the surface of the anterior buccal fang, with the periosteal membrane, swollen, and containing a quantity of pus. The same state existed, to a greater degree, at the bifurcation of the fangs; but, to my surprise, nearly the whole of the posterior fang was absent, and only a small projection occupied its place. I was satisfied that this fang had not been broken off in the operation of extraction; and on examining its surface more minutely, it had none of the sharp edges or of the glistening surface which characterizes a portion of fractured dentine; on the contrary, it had the rough, dull surface which marks the appearance of the dentine when absorption has taken place. Upon passing a small excavator into that part of the socket occupied by the absent fang, it immediately struck against the crown of the wisdom tooth, which had evidently assumed an abnormal position, and was presenting forward, instead of coming down in the normal perpendicular direction.

"Any attempt at preserving the second molar and subduing the inflammation by antiphlogistic treatment would have been perfectly useless.

The operation was followed by a complete cessation of the pain, although, as is usual, when the periosteum has been inflamed, it did not entirely disappear for a day or two, until the parts had recovered from their diseased conditions."

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"ODONTOLOGICAL SOCIETY OF GREAT BRITAIN.—Monthly meeting, December 7th, 1863. Samuel Cartwright, Jun., Esq., President, in the chair.

"*Tumor dependent upon the presence of Supernumerary Teeth.*—Mr. Tomes related the following case:—A fellow-student, Mr. Matthias, many years since entered the Indian Service, and accepted an appointment to a civil station. A Hindoo, aged 25, applied to him with a large tumor on the front part of the upper jaw, pressing the upper lip up against the nose, and to some extent pressing the nose toward the forehead. It had all the appearance, he told me, of malignant tumor, and at first sight justified the opinion that a large portion of the upper jaw must be removed. The patient was sent into the hospital, the diseased part was treated with charcoal poultices, and the native dresser directed to syringe the surface, so that Mr. Matthias could make a careful examination of the tumor, and ascertain its character. In using the probe, the instrument came in contact, underneath some red granulations, with a hard body, which, on removal, was found to consist of teeth. He found other masses, and removed them, to the extent of something like fifteen or sixteen. The patient was sent to bed, the swelling rapidly subsided, and in the course of a month or six weeks he had perfectly recovered, and the only peculiarity in the patient's mouth consisted in the absence of the four central incisors of the upper jaw."

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"CENTRAL SOCIETY OF GERMAN DENTISTS.—Abstract from the Report of the Fifth Annual Meeting, translated from the *Deutsche Vierteljahrsschrift für Zahnheilkunde* for October, 1863, by George Henry, L.D.S.

"Fifth Annual Meeting, July, 1863. The President, Dr. Heider, in the Chair.

"The Fifth Annual Meeting of the above Society, held as prearranged, on the 6th, 7th, and 8th of July, at Frankfort-on-the-Main, in the Great Hall of the Lodge Karl, Gr. Gallusstrasse, seems to have passed off most satisfactorily to the Society. The attendance was large, including over seventy members of the dental profession, from different parts of Germany, besides foreign representatives and many eminent physicians of Frankfort-on-the-Main.

"The first sitting was opened by the president, Dr. Heider, with a short congratulatory address, after which he commented on the contents of the programme then before the members, dwelling particularly on the more important questions which demanded a thorough solution, and requested that fresh subjects occurring to the members should be brought forward, and opportunity for their discussion would be afforded. Dr. Hering then made a few remarks, cordially greeting the members, after which Dr. Zeitmann offered a hearty welcome to his many colleagues who visited Frankfort, in order to be present on this special occasion.

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"*Are Sugar and Tobacco detrimental to the Teeth?*—Hr. Klare considered that in order to judge of the effects of sugar, it was necessary to distinguish between the mechanical effects exerted in the mouth, and those through the system. Sugar was taken into the mouth either in solution or in crystals. Biting sugar might be detrimental to teeth when these were already carious, but sugar in solution did not remain long in the mouth, therefore no particular action on the mucous membrane was observable. Sugar occasioned pain in carious teeth, which fact would show it to be a slightly corrosive agent, which we perceive by granulations. Sugar taken in moderation did not produce mischief in the system, but taken in excess it became hurtful, through an acidity of the stomach which it occasioned. Tobacco, either chewed or smoked, excited an increased secretion of the mucous membrane, and might also occasion an increased deposition of earthy matter on the teeth. Tobacco used in moderation could not act injuriously.

"Hr. Pfluger had observed that sugar in itself, as ordinarily used, did not destroy the teeth, while sugar-dust did so; this might be observed with confectioners. He had never yet seen a confectioner who at twenty-five years of age had a sound front tooth.

"Hr. Blume thought that excessive smoking produced an inflammation of the mucous membrane, which, by communicating with the peridental membrane, was injurious to the teeth.

"Hr. Zeitmann thought it erroneous to attribute the bad teeth of confectioners to the effects of sugar-dust. All workmen, who had much to do with fire, as bakers, cooks, and others, suffered from bad teeth. It had been overlooked that confectioners taste the sugar hot, which is a chief cause of the destruction of their teeth.

"Hr. Klare remarked that the teeth of confectioners suffered more particularly because they lived in an atmosphere impregnated with sugar.

"Hr. Mayer considered the fumes of sugar were injurious, and this fact could be observed in persons who did not eat it.

"Hr. Blume maintained that it was the sugar-dust which acted injuriously, and this in the following manner:—

"The destruction of the teeth of confectioners commenced in the margin of the gums,—here the enamel first broke up, and the tooth bone was attacked. If it arose from the tasting, the enamel must of necessity be flawed, and the disease would commence near the cutting edges. Moreover, confectioners did not try their preparations so hot, lest they should scald themselves. That workmen by fires did not invariably suffer from bad teeth, was seen in forgers and locksmiths, who generally possessed sound, strong teeth; and it was observable in workers of brass and copper, that it was the fumes and not the heat which destroyed their teeth.

"Hr. Suersen said it was neither the sugar nor the sugar-dust, *per se*, but it was the lactic acid which was generated through these. He believed, therefore, that when after eating sugar, the teeth were cleansed, these did not suffer, but there was a contrary result when sugar was allowed to remain in the mouth for any lengthened time. In this way sugar-dust was detrimental to the teeth of confectioners. In reference to tobacco, he considered it useful. Walrus dentures were preserved for years in the mouths of smokers without a trace of destruction; in like manner

caries in the teeth of smokers was converted from the moist into dry caries."

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"Second sitting, Tuesday, July 7th.—The members of the Society met together at 9 A.M. The President opened the meeting by reading the sixth question in the programme, as follows:—

"*Does Experience justify the Removal of the four first Permanent Molars at an early period?*

"Several gentlemen joined in the discussion which ensued, from which we may gather, that while some advocated in all cases the extraction of the first permanent molars, on the ground that these frequently hindering the proper expansion of the front teeth, were the most liable to disease, and the most difficult to save permanently, and that their removal would often avert unsightly irregularities; others considered that no special rules could be laid down with regard to their extraction, and that the expedience of the operation depended much on the state of the development of the jaws, and must be left to the judgment of the dentist The general opinion prevailed that if these teeth were not to be permanently retained, they should be extracted as early as possible.

"Dr. Leopold then read a short but interesting paper on the following question:—Are dentists subject to certain maladies in the practice of their profession, and, if so, what are they? in which he endeavored to show that dentists often suffered from a high degree of nervousness, enumerating the following as causes:—Much one-sided bodily exertion; constant in-door confinement; many successive and trying operations to the nervous system; operating in forced or unnatural postures; the effects of gases in the laboratry; straining the eyes; and the injurious influence on the mind and spirits, from which a feeling practitioner cannot withdraw. He advocated the following as the best remedial agents:—Gymnastics; rest after meals; a proper amount of regular sleep; the prompt subjection of all symptoms of indisposition; and the cultivation of useful and agreeable accomplishments, as music, literature, and the natural sciences.

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"The office-bearers having been re-elected, and several new members admitted to the Society, Munich was decided on for the next place of meeting in August, 1864."

BOSTON DAILY JOURNAL—JANUARY, 1864.

Having published a card from the defendant in this case last month, that the profession may be thoroughly informed with regard to the affair, the *decision* of the Court is now presented.

"IMPORTANT TO DENTISTS.—In the suit of H. B. Goodyear, Administrator, *v.* Joseph R. Dillingham, in the United States Circuit Court for this District, an interlocutory injunction was, after agreement of counsel, ordered by His Honor, Judge Sprague, on the 13th instant, restraining

the defendant, a practicing dentist of this city, from making hard rubber bases for artificial teeth by the process patented to the plaintiff, under whom the American Hard Rubber Company of New York hold an exclusive right. The defendant opposed the granting of the injunction on the grounds that the invention was not new, and that having purchased the American Hard Rubber Company's gum, prepared expressly for the manufacture of bases of artificial teeth, he acquired a license thereby to make them. The Court overruled the defense, holding that the defendant could not so use the gum so purchased without obtaining a license from the Company to do so. This is the same question in regard to which a meeting of dentists was held in this city some weeks ago, to take measures for organized resistance to the claims of the patentee."

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Lehigh Register.

"Death from Chloroform.—Mrs. Reichenderfer, residing in Mechanicsville, in this county, came, in company with her husband, on Saturday, to the office of Guldin & Greasemer, dentists in this place, for the purpose of having some teeth extracted. She desired to have chloroform administered; the dentists being opposed to its use, tried to persuade her not to take it; but she insisted on having it, saying that she had used it before, and knew its effects. In accordance with her request, Doctors H. F. and E. G. Martin were called in, who administered it. She was apparently a strong, healthy woman, aged about thirty years. No more than the usual quantity, or what was deemed necessary, was given her. After six or eight teeth had been extracted, she ceased struggling—her whole system relaxed, and she presented a deathlike appearance. About three hours were spent in trying to resuscitate her, but all efforts proved unavailing. The coroner was then sent for, who summoned a jury and held an inquest on the body, also a post-mortem examination; the result of the examination we have not been able to learn."

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New York Tribune.

"Another Death from the Effects of Laughing Gas.—A short time since one of our merchants, Mr. Sears, died from the effects of laughing gas, administered to him for the painless extraction of a tooth. Mr. Sears, it was presumed, died because his lungs were in the last stage of consumption. We have now to record another casualty. On the first of this month a traveling dentist, at a public exhibition of laughing gas, at Swanton Falls, Vt., administered this gas to several persons. Among the number was a beautiful girl, seventeen years of age, the daughter of W. H. Bell, Esq., a highly respectable citizen. The day after inhaling the gas she was taken ill, although she did not take sufficient to produce insensibility, and died the following day from its effects. Miss Bell presented a strong, robust physical constitution, and was in apparent good health previous to inhaling the gas."

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PERISCOPE OF MEDICAL AND GENERAL SCIENCE IN THEIR RELATIONS TO DENTISTRY.

BY GEO. J. ZIEGLER, M.D.

"*Blood-Corpuscles.*—Two varieties of corpuscles exist, red and white. As seen under the microscope, they are flattened cells, of a circular form, the red presenting either a bright or dark central spot, as they are brought in and out of focus.

"*Red corpuscles* are present in large numbers in the blood; their diameter varies from $\frac{1}{3000}$th to $\frac{1}{4000}$th of an inch, and their thickness is about $\frac{1}{10000}$th of an inch. When examined singly they appear almost colorless, and it is only when viewed in numbers that they exhibit the florid color.

"*White corpuscles* are much less numerous than the red, not more than one white to fifty colored being present in human blood. As a rule, their diameter is greater than that of the red corpuscles, and may be estimated at $\frac{1}{2300}$th of an inch. The form and appearance of the corpuscles, both red and white, varies greatly, according to the character of the liquid in which they float. The color of the blood may even be altered by a change of form in the corpuscles. Thus it is probable that the difference in color of arterial and venous blood depends on an altered form of the corpuscles contained. When subject to the action of water, corpuscles swell, become convex, or even round, and may at length burst.

"With regard to the structure of *red* blood-corpuscles, they may be considered to be cells, provided with an elastic cell-wall, inclosing apparently homogeneous contents impregnated with red coloring matter, called hæmatine. The *white* corpuscles, however, seem to contain granular matter, the cell-wall being scarcely ever visible unless the corpuscles are treated with water or diluted acid, when the cell becomes distended, and the wall separated from the inclosed matter.

"If the minute vessels in the web of a frog's fōot are examined, both varieties of blood-corpuscles will be seen hurrying along in the current of the blood, the red moving rapidly in the centre of the stream, the white passing more slowly along the sides of the vessels.

"The functions served by the blood-cells have not been determined, nor has it been ascertained how or where they are formed. The most probable source of their origin is, that they are formed from the chyle and lymph corpuscles poured into the blood from the *thoracic duct;* as in the general current of the blood, corpuscles in intermediate stages of development are always found, and indeed, occasionally the fluid in the thoracic duct has a red tinge, supposed to be due to the commencing development of hæmatine in the interior of the chyle-corpuscles. Doubtless the blood-cells are continually undergoing decay, while others are being generated to supply their place; and most likely they are derived in the manner just noticed, for they are proved not to be developed by fission of the pre-existing corpuscles.

"Chemically, the blood may be regarded as an alkaline fluid, composed principally of water, containing a certain amount of solid matter. Among the more important components of the solid matter, hæmatine may be mentioned. It is stated to contain iron, and is found mixed with globuline, the compound being termed *cruor.*

Chemical Composition of the Blood.

Blood	Water			795
	Solid matter	Corpuscles	Hæmatine	8
			Globuline	140
			Iron	1
		Fibrin		2
		Albumen		40
		Fat		2
		Salts		8
		Extractive matter		4
				1000

"The difference between venous and arterial blood, as regards color, has been already noticed; but other differences exist; thus, in the arterial fluid there is less albumen and more fibrin than in the venous. Moreover, the specific gravity is lower, the amount of red corpuscles greater, and probably, the proportion of oxygen larger in the arterial blood.

"*The quantity of blood in the body.*—The precise determination of this point is difficult. It has been found that if numerous vessels in the body of an animal are opened, and the blood permitted to pour from them, a large quantity can be collected. In this manner it has been estimated that the weight of the blood is to that of the body:—

As 1 to 12 in an ox.
" 1 to 18 in a horse.
" 1 to 16 in a dog.

"These data can only be an approximation to the truth; for however freely the vessels are opened and the blood permitted to flow, still a large quantity must remain in the body. Nor can such an experiment be made on the human subject, except, indeed, in cases of execution. It is stated that as much as 24 lbs. of blood were taken from a decapitated female. Applying the results of experiments on other animals to the human body, it appears that the amount of blood contained may be estimated at 18 lbs. to 20 lbs."—(*Ext. from* "A Manual of Animal Physiology," by John Shea, M.D., *Quarterly Jour. of Microscopical Science.*)

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"*Caries and its Relation to Necrosis.* By William S. Savory, F.R.S., Assistant Surgeon to and Lecturer on Physiology at St. Bartholomew's Hospital.—In the process of ulceration the destination of the substance which disappears has ever, since Hunter's time, been much discussed. Are the parts which are removed absorbed or ejected? If absorbed, by what agency? If ejected, in what form? Do the particles degenerate and disintegrate and mingle with the fluids which escape, or are they decomposed and dissolved therein? These questions have engaged much attention, and have received various answers; the advocates of either view appealing to certain facts in support of their opinion. But the contradictory evidence which the facts themselves appear to furnish suggests the inquiry whether these questions really meet the nature of the case.

"Nutrition consists essentially of two processes—the removal of old particles and the substitution of new ones. During life, these changes,

though varying widely in rate in different tissues, are constantly going on. Effete or worn-out particles are taken away; fresh ones are deposited in their place. Now, if the amount of new material which is supplied is exactly equivalent to that of the old which is lost, there is neither loss nor gain of substance—no visible change. But if the removal of old matter is not met by an equal supply of new, there will, of course, be loss of substance; while if the new matter deposited is in excess, there will, of course, be gain. If these facts are applied to the process of ulceration, cannot the changes which occur be explained? If from any disturbance in the healthy nutrition of the part affected the repair is not commensurate with the waste, an ulcer must extend; while, in order that it may heal, the repair must exceed the waste. No ulcer can be, in the strict acceptation of the term, stationary. It may neither visibly increase nor decrease; but the tissues in which it is seated must be, while life lasts, subject to those changes—to those processes of waste and repair—of which nutrition essentially consists. So then, when an ulcer spreads or extends, it is not because of a peculiar pathological process appertaining to the ulcer as such, but rather because of a want of balance between waste and repair. True that the substance which disappears may be absorbed, but this absorption is universally going on. It may be morbid in degree, too rapidly progressing, and thus the ulcer spreads; but a similar result will be produced by a normal rate of absorption if the process of renewal be deficient.

"These various conditions are illustrated in different ulcers.

"In the indolent ulcer, with a comparatively dry surface, the processes of waste and repair are equal, or nearly so, but both are feeble and languid.

"In the healing ulcer, the repair is most active. The superfluous material—superfluous indeed so far as the formation of new substance is concerned, but by no means useless—degenerates into pus.

"In the phagedenic ulcer, there is excessive wasting. In the worst forms, more than this: the superficial portions disintegrate and die before they can be absorbed, and are then ejected from the surface.

"In sloughing ulcers, larger and more visible portions perish, and are cast off in masses. Between the mildest form of phagedenic action and the most rapid sloughing all intermediate degrees are met with.

"These examples may suffice to illustrate the argument which has been advanced.

"To apply this to Caries—destructive ulceration of bone. Here, again, the study of the process has been encumbered with the question whether the bone which disappears is ejected or absorbed. Here, too, facts have been cited in support of either view of apparently a contradictory nature. Some of them, it must be confessed, are of doubtful import. For example, of what value is the bare fact that in the discharge from carious bone an unusual quantity of phosphate of lime has been found? To make this of real value, the inquiry must be carried further. The actual amount lost by the bone and the actual amount discharged in any given time should be ascertained; and further still, it should be satisfactorily shown that the disintegration of the carious bone is the sole source of the phosphate of lime which is thrown out. But, on the contrary, there are good grounds for concluding that this phosphate of lime may be furnished in another way.

"Suppose that our knowledge of the changes which occur in normal nutrition be applied to caries—is not the result of this morbid process,

in great measure, explained? The removal of old bone is not accompanied by an equivalent formation of new bone. The old bone may simply disappear at the normal rate, or even at a rate much below this, or its removal may be accomplished with morbid rapidity. Nay, from some cause or other, it may die and disintegrate so rapidly as to escape absorption, and the débris may be thrown off from the surface. Nay, further still, death may occur yet more suddenly, and visible fragments may be detached, or portions may be separated too large to escape, as in necrosis.

"Now, it by no means follows that while destructive ulceration of bone is proceeding, the process of repair in the affected part must be entirely suspended. In the worst forms—in phagedenic ulceration—this may be so; but let it be borne in mind that an ulcer must necessarily extend, that there must be loss of substance whenever the rate of waste exceeds, in any measure, that of repair.

"And thus, too, the character of the tissue bounding an ulcer of bone may be understood. The question has been often asked, When bone ulcerates, what portion of it disappears first, the earthy or the animal matter? Hunter said that in the ulceration for the separation of dead from living bone the earthy matter disappeared from the boundary of the living bone, leaving the animal tissue behind; while it has been generally asserted that in caries the reverse prevails, the animal matter disappearing and leaving the earthy. Now, with regard to the latter statement, it can be believed that the rate at which different constituents of a structure are removed by absorption may vary, and that when the process is unusually or morbidly rapid, certain constituents, those least prone to the changes which precede or accompany absorption, may be left behind. Thus, earthy matter, more or less completely deprived of the animal, may appear at the surface of carious bone. But, on the other hand, when ulceration of bone occurs as what may be termed a healthy process—as, under some circumstances, in the separation of dead bone—what then? A substance soft and evidently not osseous tissue invests the living surface from which the dead bone has become detached. But is this the old bone deprived of its earthy matter? Surely not. It is a structure altogether new, formed upon the surface of the living bone—a structure which may probably pass into new bone, or which may undergo other changes leading to a different result. But whatever may be its ultimate destination, the old bone which has been removed has been replaced by fresh material which is not as yet converted into bone. All this is set forth more clearly, though not more surely, in the simple repair of bone, especially in a healing ulcer, as when an excavation is filling up by granulation. No one would for a moment regard the soft vascular tissue—the granulations—which invests the surface as the animal matter of bone deprived of its earthy particles. It is, strictly speaking, incipient bone; a newly formed structure, which will in part become bone, in part pass through other changes, degenerating into pus. It is simply a young structure, the future course of which will be determined by the influences to which it is exposed. So, surely, with the soft tissue formed in or on bone under other circumstances. It cannot be old material left behind, for this could never last. It is altogether a new structure, undergoing changes more or less divergent from those through which bone is normally formed. It may, indeed, very probably become bone; but there are no better grounds for regarding it as the remains of what was once bone than there are for a similar view of the periosteum or medulla.

"Mr. Goodsir thus describes the process of exfoliation: 'When a portion of a dead or dying bone is about to be separated from the living, the process which occurs is essentially the same as that which has been described, [*i.e.* the progressive ulceration of soft parts.] The Haversian canals, which immediately bound the dead or dying bone, are enlarged contemporaneously with the filling of their cavities with a cellular growth. As this proceeds, contiguous canals are thrown into one another. At last the dead or dying bone is connected to the living by the cellular mass alone. It is now loose, and has become so in consequence of the cellular layer, which surrounds it, presenting a free surface and throwing off pus.' It has been said: 'This statement is of especial interest, as a confirmation of the accuracy of Hunter's view of the subject, obtained without the advantages enjoyed by the modern microscopic observer. The remark of Mr. Goodsir, that the dead bone, in the later stage of its exfoliation, is connected with the living bone by a cellular mass alone, corresponds with the representation of Hunter, that the process of exfoliation commences with the absorption of the earthy matter in the living bone contiguous to the dead bone.' But is not the enlargement of the Haversian canals, so that they are at length thrown into one another, and the filling of their cavities contemporaneously with a 'cellular growth,' evidence, not merely of the absorption of earthy matter, but of the simultaneous removal of the old, and the production of a new tissue, a portion of which may at length pass into bone, but the surface of which degenerates into pus?

"In caries, then, the normal nutrition of bone is no longer maintained. The fresh material which is to supply the place of the old is not converted into bone, but undergoes other changes; it degenerates. Its physical and chemical characters are changed. It remains soft, and does not yield an abundance of lime salts. More or less of it undergoes further changes; still degenerating, it passes into pus. The abnormal substance which is found in carious bone varies in its characters according to the kind and degree of degeneration it has undergone, presenting either a cellular structure, as granulation or pus, or little more than fragments of disintegrating tissue with molecules and globules of oil.

"The character of an ulcer of bone, like that of soft parts, may generally be diagnosed from its appearance, and still better from a careful examination of it. The healthy granulation substance of a healing ulcer—bright, florid, soft like velvet, vascular, bleeding upon the slightest violence, and sensitive, with healthy pus on the surface, and sound bone immediately underneath—contrasts strongly enough with the surface of a carious ulcer, which is of a dull dusky color, with a rough and irregular surface, or more or less craggy, with minute spicula of disintegrating bone scattered throughout: in the more chronic forms almost dry upon the surface; in the more acute stages discharging a fluid which is for the most part ill-formed, decomposing pus, mingled with more or less blood and oil and the débris of disintegrating tissue; while, in either case, for some distance beneath the surface the bone is evidently unsound. It readily breaks down under pressure, or can be penetrated by a probe. A more minute examination yields evidence of rapid degeneration, such as the breaking up of the osseous tissue and the presence of an abundance of free oil."—(*Lancet.*)

"*Atrophy considered in its Surgical Aspects.*—By Mr. E. Canton, President of the Medical Society of London. This, the author observed, we have constantly occasion to encounter as constituting a malady *per se*,

or to a greater or less extent complicating other maladies. Sometimes it may be regarded as a salutary process, as in the wasting and disappearance of a cancerous tumor, or it may be the harbinger of death where a vital organ is the object of its attack. A single part might be affected, or the whole organism be involved. A tooth shall be lost, and the alveolar process wastes; or the whole body may be prematurely involved in the atrophy of senility. Attention was then directed to the atrophy of the neck of the thigh-bone, which sometimes ensues from a blow on the trochanter major; and the belief expressed that in such instances, some faulty state of the system must have been pre-existent—as gout, rheumatism, or rheumatic gout, and which the author had always detected in the instances that had fallen under his observation. Intra-capsular fracture of the cervix femoris was next discussed, in reference especially to antecedent changes in the cervix and absorption of it subsequent to the fracture. The peculiarities of atrophy of the arteries were now passed in review, and the various forms of degeneration of their coats considered, especially in regard to deligation and aneurism. Gangrene of the distal parts of the extremities was also fully discussed in reference to atrophy of the arterial tunics; and the suggestion made that the vasa vasorum had never been microscopically examined in cases where the walls of the arteries had suffered atrophic changes. Atrophy of nerves, muscles, etc. were spoken of as bearing upon the practice of surgery. Atrophy of the heart was fully considered, and several instances were related in which its presence had materially complicated the diseases the surgeon is called upon to treat. Lastly, the author enlarged on the subject of atrophy as a *salutary* process, and illustrated its beneficial effects by reference to the process spontaneously occurring, as in the wasting of carcinomatous masses, and the required changes which occur in many maladies treated by either the art or science of the surgeon."—(*Ibid.*)

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"*Ranula.*—Several cases of this affection have been admitted into St. Bartholomew's Hospital, under my charge during the last year; two of them of unusually large size. Some of these presented the more ordinary characters of the disease, consisting of a semi-translucent cyst, on which small vessels, evidently veins, ramified beneath the tongue. In the two cases above referred to, the cysts extended at least one-third of the way down the side of the neck below the base of the jaw. Opinions differ as to the seat and the cause of the formation. On one occasion I extracted a small portion of calcareous matter from what I presumed to have been the orifice of a duct, in a case of ranula, by the removal of which the disease was cured. The practice of laying open the cavity, and applying nitrate of silver to the interior, is adopted by many surgeons; but I have seen the disease return after the adoption of this remedy, and it is a somewhat violent remedy for so slight a disease. A thread will cure it quickly, and without pain or inconvenience. The silk should be passed through *the middle* of the cavity, otherwise the absorption of the contents is so rapid, and the adhesive process so active, that a small residue of the cyst will escape, as it were, from the thread, which occupies the situation of the former disease, now reduced to very small dimensions. The first thread should be removed, and another introduced through the remaining part of the cyst.

"The large examples of ranula are rare. Commencing in the sublingual region, they extend down the side of the neck, presenting a rounded prominence of considerable size; the surface is uniform, and the skin not

discolored; the contents are obviously fluid. The portion of the cyst within the mouth is not unusually large; but the pressure of the two fingers readily detects the identity of the two swellings. In these larger examples the influence of the thread is equally efficacious as in the ordinary ranula. It may be passed by means of a long needle from the mouth to nearly the lowest part of the projecting cyst and brought through the skin of the neck, and the ends tied together, the upper end being brought through the mouth. The lesser ranulæ are thus curable often in a few days; the larger require from fifteen to twenty days."—F. C. Skey, F.R.S.—(*Ibid.*)

"*Transactions of the Odontological Society of Great Britain.* Vol. iii., 1861–62–63. London, 1863.—The science of dentistry must be more prolific in varied matter of interest and research than could have been supposed, to enable the Odontological Society to publish, in a third volume of Transactions, so many interesting and really original papers as are contained here. The papers are by no means all of them on subjects purely technical. Mr. Coleman's essay on Anæsthesia in Dental Surgery is an excellent article on anæsthesia generally, from a perfectly sound and practical point of view, and of course especially applied to operations about the mouth. Mr. Bridgman's paper on the Absorption of Bone and Dentine is a bold and clever attempt to solve a question of the highest general physiological interest. He endeavors to show that the absorption of these substances is one of the results of the electro-voltaic mechanism of animal life; or, in other words, that it is strictly a part of the 'electro-biology of the system.' This he works out, not in a vaguely theoretical manner, but by imitating the decalcification of bone, and by the artificial formation with electrical aid of a substance resembling bone. This subject he follows in his prize essay, 'On the Pathology of Dental Caries;' in which he explains and imitates all the phenomena by electro-chemical action. It will be seen that there is a great deal of really new and valuable matter in these pages, into which we have only dipped here and there. In paper, printing, and general style, the volume resembles (but excels) the 'Medico-Chirurgical Transactions,' and it is altogether highly creditable to the body of English dentists."—(*Ibid.*)

Hereditary Syphilis.—In a review of a recent publication "*On Certain Diseases of the Eye and Ear, consequent on Inherited Syphilis, with an appended Chapter of Commentaries on the Transmission of Syphilis from Parent to Offspring, and its more Remote Consequences,* by Jonathan Hutchinson, F.R.S.C.," the *Med. Times & Gazette* gives an interesting summary of the writer's observations upon this subject, from which we extract the following: "Given certain diseased conditions of the eye and ear in young persons, the author undertakes to prove by clinical evidence that they derive their origin from inherited syphilis. For the most part, the patients themselves can give no assistance in tracing them to the supposed cause, and considerations of moral obligation or motives of kindness preclude the surgeon from pursuing his investigation by direct questioning. He is thus driven to indirect methods of arriving at his object. In some instances, indeed, this is not the case, as one or both parents may either exhibit unmistakable marks of syphilis, or may confess to its occurrence, or may detail enough of the previous medical history of the child to supply full conviction to the mind of the surgeon. But in the majority of cases of suspicious disease it is not so,

and the difficulty to be met is to fix upon some unmistakable tokens or objective signs of the hereditary syphilitic diathesis,—such as shall declare to all who observe them, that the person exhibiting the marks is hereditarily infected. Taking these signs as positive indications, corroborative evidence may be sought to strengthen the case in the eyes of the less believing. Now Mr. Hutchinson considers that he is in possession of such objective tokens; at all events, in persons whose age has advanced to the period of second dentition. We are not about to discuss the accuracy of this test; it is sufficient for us here to say that he quotes Mr. Dixon and Mr. Paget as satisfied with its value. To those persons who are disposed to accept the test, this work will be conclusive in its reasoning; to those who do not accept it, the conclusions of the author will not be satisfactory. Such persons must withhold their judgment until they have tested by their own experience the test itself. The test of hereditary syphilis, in the difficult cases alluded to, mainly lies in the exhibition of certain developmental peculiarities especially obvious in the state of the permanent teeth, but also in other marks, respecting all which we shall allow our author to speak for himself. '*The central upper incisors of the second set are the test teeth*, and the surgeon not thoroughly conversant with the various and very common forms of dental malformation will avoid much risk of error if he restrict his attention to this pair. In syphilitic patients, these teeth are usually short and narrow, with a broad vertical notch in their edges, and their corners rounded off. Horizontal notches or furrows are often seen, but they, as a rule, have nothing to do with syphilis.' p. 204. A plate, illustrative of typical syphilitic teeth, is given. 'Next in value to the malformations of the teeth are the state of the patient's skin, the formation of the nose, and the contour of his forehead. The skin is almost always thick, pasty, and opaque. It also often shows little pits and scars, the relics of a former eruption, and at the angles of the mouth are radiating linear scars running out into the cheeks. The bridge of the nose is almost always broader than usual, and low; often it is remarkably sunk and expanded. The forehead is usually large, and protuberant in the regions of the frontal eminences; often there is a well-marked broad depression a little above the eyebrows. The hair is usually dry and thin, and now and then (but only rarely) the nails are broken and splitting into layers.' p. 205. And then follow some signs which we must pass over, referable to former syphilitic attacks of inflammation of the eyes. All these signs together Mr. Hutchinson calls the 'syphilitic physiognomy.'

"The diseases of young subjects, about which Mr. Hutchinson is most certain that he is correct in referring them to hereditary syphilis, are acute iritis, chronic interstitial keratitis, and inflammation of the choroid and retina. * * * * * * * * *

"Nearly half the book is occupied in the discussion of the syphilitic origin of chronic interstitial keratitis, respecting which the author says that its occurrence is not only now considered by several high authorities as pathognomonic of inherited taint, but that 'it is almost invariably coincident with the syphilitic type of teeth, and, when these two conditions are found together in the same individual, I should certainly feel that the diagnosis was beyond doubt.' p. 205. This being the importance attached by Mr. Hutchinson to the matter, one cannot be astonished at his devoting so much space to the subject. Indeed, he tells us at starting that the heredito-syphilitic origin of this disease, and of the dental peculiarities mentioned, are the principal assertions met with in the pages

of his book. It is a disease which, under the name of 'scrofulous corneitis,' has frequently been described by authors on ophthalmology. The following are the chief reasons which have induced Mr. Hutchinson to regard it as a direct result of inherited syphilis:—'1. From its being a very well-marked and peculiar form of ophthalmia, it is *a priori* probable that it acknowledges some single and definite cause. 2. Its subjects are almost invariably of a very peculiar physiognomy, and usually bear the most marked similarity to one another. 3. Its subjects almost invariably have their upper central incisor teeth of the permanent set dwarfed and notched in a peculiar and characteristic manner. 4. In most cases the features alluded to under the last two heads bear no resemblance whatever to those of struma properly so called. On the contrary, the subjects of tuberculous struma usually have large white teeth, and are often of a florid complexion. 5. I have not yet seen a single case in which the patient was the subject of phthisis, and but very few in which suppuration of the glands of the neck had occurred. 6. It affects by preference the eldest living child of the family; a circumstance to be expected under the syphilitic hypothesis, but wholly inexplicable under that of struma. 7. It affects female children in preference to males, and usually occurs in families in which a large infantile mortality has taken place. 8. It occurs in all classes of the community; the well-fed and under-fed, the residents of the most healthy situations, (sea-coast, etc.,) as well as those of crowded cities. 9. In a large proportion of those cases in which I thought it right to make direct inquiries on the subject, I obtained a confession that one or other parent had suffered from constitutional syphilis prior to the birth of the patient. 10. In a very large majority of those cases in which I obtained information as to the health of the patient during early childhood, a clear history of the usual symptoms of infantile syphilis was given. 11. In many instances there was a clear history of symptoms of infantile syphilis having been observed in brothers or sisters of the patient. 12. While, as above observed, enlargements of the lymphatic glands are unusual, other affections far more closely connected with syphilis than with true struma, such as nodes, ulceration of the palate, and erosive lupus, are not unfrequent in subjects of this disease.' p. 124. Mr. Hutchinson's conclusions are derived from 102 cases, which are detailed and tabulated in his book. He tells us that the prognosis is favorable just in proportion as the intolerance of light is slight, and that even in the most severe cases a certain amount of clearing may be anticipated. The treatment he prefers is the use of mercurial ointment behind the ears, in the neck, and under the axillæ every night, and of a mixture containing iodide of potassium, iodide of iron, and tincture of nux vomica."

Semeiology of Inherited Syphilis.—"Mr. Ernest Hart exhibited to the Medical Society of London and gave clinical details of cases of ophthalmic disease pathognomonic of inherited syphilis.

"In these cases, the characteristic notching of the teeth and the character of the interstitial inflammation of the cornea had been useful in directing attention to the probability of a syphilitic taint of the parents as the cause lying at the bottom of the disease in the children. Inquiry into the history in the three cases detailed had given ample confirmation of the suspicion thus engendered. In one of the cases this had been especially useful, inasmuch as the ophthalmic disease had been considered primarily as of the ordinary scrofulous character, and non-specific reme-

dies had altogether failed to arrest the progress of the malady. One eye had thus been lost, and the other was gravely compromised; it had, however, considerably recovered under the use of mercurial inunctions, and subsequently of iodide of potassium; but vision would probably continue imperfect, owing to the extent to which the sloughing of the cornea had already proceeded.

"Mr. Coulson said there was one condition Mr. Hart had not referred to—namely, the great depth of the palate.

"Mr. Hart said it was well marked in this child.

"Mr. De Meric cited a case, brought to him at the hospital, laboring under hereditary syphilis. The great peculiarity of the child (ten months old) was that it was blind, yet no change could be seen in the eye. Most of the hereditary symptoms disappeared, but years elapsed before the sight was quite restored.

"Mr. Bryant cited another case where the diagnosis was very difficult, but determined by the state of the teeth; it was treated as syphilis, and a rapid recovery followed.

"The president asked whether Mr. Hart and Mr. Coulson observed the state of the teeth in those cases where the arch was deeply developed, but where there was no evidence of syphilitic inheritance.

"Mr. Coulson had often seen deep arching without any notches of the teeth, or other peculiarity in them, excepting that they projected forward. He had always seen it in hereditary syphilis."—(*Lancet.*)

Value of the Laryngoscope.—"Dr. Gibb related to the Medical Society of London a case of united fracture of the pomum Adami in a phthisical lad, aged nineteen, who came under his notice among the out-patients at the Westminster Hospital, and who was afterward admitted under the care of his colleague, Dr. Basham. When eight years old he met with an accident by which the thyroid cartilage was broken at the pomum Adami; this was followed by an abscess, which burst, and the fracture healed. The pomum was prominent and sharp, the two sides irregular and narrow, and the larynx had become narrow, as shown with the laryngoscope to many of the hospital pupils. The voice was sharp and shrill, yet feeble.

"Mr. Bryant congratulated Dr. Gibb on the success of the operation in his first two cases. He himself had a case like the last one, at the present time under observation in Guy's Hospital. A little boy, aged eight years, received a blow with the fist from one of his school-fellows, which was followed by considerable dyspnœa and loss of voice. On examining the larynx he found the thyroid cartilage fractured to the right of the median line. He had not examined the throat with the laryngoscope, but would do so, as the boy could still only whisper. Ever since the injury he had been subject at night to considerable dyspnœa; and had had epistaxis on five or six different occasions following this dyspnœa.

"Dr. Morell Mackenzie observed that the cases brought forward by Dr. Gibb were extremely interesting, as they showed that the laryngoscope could be employed with the greatest advantage in cases of extreme emergency. He especially called the attention of those unaccustomed to the use of the laryngoscope to a small sulcus situated on each side of the larynx, as being especially liable to receive and retain foreign bodies. This sulcus was bounded on the inner side by the aryteno-epiglottidean fold, and on the outer side by the wall of the pharynx; its base was formed by the greater cornu of the hyoid bone. Dr. Mackenzie stated

that he had frequently found particles of undigested food collected in this fossa, and he should therefore recommend its careful examination in cases where small foreign bodies were supposed to have been lodged in the larynx.

"Mr. De Meric inquired if in impending suffocation it was proper to use the laryngoscope, and whether in such a case it was easy to introduce the instrument.

"Dr. Gibb replied that it was truly remarkable with what facility the laryngoscope could be used in some of these painfully acute cases, such as foreign bodies like the one related, acute laryngitis, urgent suffocative dyspnœa, etc. In his first case, if the pin had not been extracted from above, it would have been necessary to perform tracheotomy then and there. He had seen crumbs of bread, broken teeth, and other substances lodged in the fossa spoken of by Dr. Mackenzie, but there was nothing novel in the description he had given of it."—(*Ibid.*)

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Tonsillitis from Impaction of a Bristle.—"Dr. Gibb showed to the same society a toothbrush bristle extracted from the tonsil, which had given rise to great irritation, swelling, and congestion of the fauces, the symptoms of sore throat becoming alarming on the sixth day, with pain in the left ear, forehead, and neck. Its point could be felt in the tonsil by the patient and by Dr. Gibb; a powerful light with the aid of the pharyngoscope permitting this to be barely seen, it was laid hold of and extracted, the throat symptoms quickly subsiding."—(*Ibid.*)

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"*Passage of Foreign Matter from the Mother to the Young through Milk.*—The fact having previously been noticed by Flourens, that the bones of the fœtus became colored red when the mother has been fed upon red coloring matter, he extended his observations still further, and has found that the bones of the young offspring become red-tinted, when, during the period of nursing, its mother feeds upon reddened food. The experiment succeeded perfectly in young suckling pigs, of which the bones became red in from fourteen to twenty days. Since, however, the pigs might have eaten some of the reddened food of the mother, Flourens selected another class of animals for experiment, in which this source of error could not exist, viz.: albino rats and rabbits. In the albino rat, the skeleton became red in eleven days; in the albino rabbit, the same phenomenon occurred in nine days, though not a trace of reddened matter had been eaten by the young, since they had lived wholly upon the milk of their mothers."—(*Canstatt's Jahresbericht, Glasgow Med. Jour.*, and *Dublin Med. Press.*)

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"*Callus.*—Dr. Jobert de Lamballe has published another paper on the subject of callus, or that secretion which nature has provided in order to join fractured bones together again. You remember that, in the first paper I mentioned some weeks ago, he described four different theories admitted by practitioners to explain the phenomenon. In the present one he continues their enumeration, with a view ultimately to overthrow them all. According to the fifth theory, the fragments are reunited by a process similar to that observed in the case of the fleshy parts. Buds of flesh, so to say, or caruncles, grow out of the fractured surfaces, come into contact with each other, are then transformed into cartilage, and ultimately into bone. Bichat distinguishes three periods: In the first, these fleshy caruncles are formed; in the second, they become cartilage; and

in the third, bone. But in his opinion the cartilage is at first vascular and cellular, then it acquires cellular tissue, vessels, then gelatine from the caruncles, and lastly, calcareous matter. The sixth theory admits that callus may be formed by lymph, which becomes vascularized, and then cartilaginous and osseous. Hunter supposes certain granular excrescences developed between both ends of the fractured bone. Richerand believes that bones will join again at once, on being nicely readjusted, through the medium of the gelatine which has been emitted According to MM. Breschet and Villerme, during the first period, from the moment of the accident to the eighth, eleventh, or sixteenth day, blood is spilt and coagulates, the parts around are inflamed and swollen, the medullary canal is either partially, and the coagulum is reabsorbed. During the second period, that is, from the sixteenth to the twenty-fifth day, the swelling of the callus is distinguishable from that of the surrounding organs, the medullary canal is obliterated at the point of fracture, and the medullary membrane is swollen. During the third period, from the twentieth to the sixtieth day, the tumor of the callus becomes cartilage, and ends in forming two rings, an inner and an outer one, around the fracture. During the fourth period, from the end of the second to the sixth month, the ossified callus is changed from spongy to compact tissue; and during the last period, from the sixth month to the twelfth, the medullary canal is restored, the periosteum returns to its ordinary state, and the medullary membrane and marrow are reproduced. The seventh, and most modern theory, supposes that, after the reabsorption of the blood, the plastic lymph exuded is soon invaded by a number of cells separated from each other by a cartilaginous tissue, which soon becomes bone. Dr. Jobert concludes by a praise of the practice of vivisection, without which physiology could never, he says, have made the immense progress we now mention."—(Dr. W. N. Côte, *Med. and Surg. Reporter.*)

"*Plastic Operations on the Face.*—Dr. Gurdon Buck, of New York, presented to the Medical Society of the State of New York a male patient who had been the victim of an extensive destruction of the face by gangrene, and read a paper in relation to the same, entitled 'A Case in which several Plastic Operations were successfully performed, for the Restoration of the Right Half of the Upper Lip, and adjacent Portions of the Cheek and Nose.' Dr. B. stated that on the admission of the case into the New York Hospital, on the thirty-first day of December, 1862, the patient's right eye was destroyed and sunken. The right half of the upper lip, the right ala of the nose, and the adjacent portion of the cheek, besides the entire right superior maxillary bone, is gone, which left an extensive opening directly into the cavity of the mouth and right nasal fossa. To rectify this deformity, the patient was subjected to five separate operations, at as many different times. Dr. B. presented photographic views of the patient's face before the first operation, one showing the result of the first operation, and one showing the result of the second operation; also photographs showing the final results, one giving a front view, one a right side view, and one giving a left side view. The superior maxillary bone is now in the anatomical museum at Washington City."—(*Amer. Med. Times.*)

"*Tumors.*—The more simple and innocent a tumor, the more nearly it approaches in structure the highly organized portions of the body; the more malignant a tumor, the more it approaches the most elementary or

embryonic. In proportion, therefore, to the amount of the cell element in a tumor, may its cancerous tendency be determined; and the greater the proportion of the fibrous or well developed structure, the greater the probability of its nature being innocent or simple. Simple tumors will never do more than separate the parts between and beneath which they are developed; cancerous tumors, as a rule, infiltrate the parts, but never separate them. The skin may be stretched and attenuated by a simple tumor, so as to ulcerate or burst; but it will never be infiltrated with the tumor's elements. The skin covering a cancerous tumor becomes rapidly involved, it seems drawn down to it, and as if glued to its surface; and when ulceration has commenced, the edges are palpably indurated, thickened, and infiltrated with cancerous products. Cancerous tumors have a marvelous tendency to multiplication, and never exist for any period without implicating the lymphatics of the part with which they are connected. In a case of tumor the nature of which is doubtful, from both its local and general conditions, the presence or absence of an indurated absorbent gland (not an inflamed one) will tend more than anything else to solve the problem. The recurring fibroid tumor is a connecting link between innocent and malignant growths. They have a constant tendency to return, after removal, either in the same place or in the neighboring parts. There is nothing distinctive in their external character by which they can be known. Microscopically they possess more of the cell element than the innocent form, and the more rapid the development of a tumor the more cellular its structure."—(MR. T. BRYANT, *Braithwaite's Retrospect.*)

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Death from Chloroform.—"Out of fifty-one cases of death from chloroform, thirty-eight declared their danger by sudden stoppage of the pulse; twenty-five of these showed in addition, as a chief sign, pallor of the countenance. In two deaths the symptoms have occurred thus:—sudden vomiting, instant cessation of the pulse, (food had been taken just before.) In six cases congestion of the face was the most marked symptom. In eight cases cessation of the breathing was the most noticeable symptom. What is to be done in cases of threatened death? There is only one perfect stimulus to the failing heart—the stimulus of aerated blood; and the only means of producing this is by the excitation of respiration.* Artificial respiration may be practiced by one of the two postural methods,—that of Dr. Silvester, or that of Marshall Hall; or by mouth to mouth insufflation, or by galvanism of the phrenic nerve. Before any means for artificial respiration are adopted, the tongue should be well drawn forward. A great error would be committed if a patient *in extremis* were wheeled round to an open window. Dr. Richardson has well established the value of warmth as an adjunct to the respiratory efforts."—(DR. SANSOM, *Medical Times and Gazette*, and *Ibid.*)

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"*Temper and the Voice.*—The influence of temper upon tone deserves much consideration. Habits of querulousness or ill nature will communicate a cat-like quality to the singing, as infallibly as they give a quality to the speaking voice. That there really exist amiable tones is not an unfounded opinion. In the voice there is no deception; it is to many an

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* Arterialization and respiration can be most readily induced in asphyxia, by nitrous oxide, either in its gaseous form through the lungs, or condensed in water and introduced into the alimentary canal by the mouth or bowels.--Z.

index to the mind, denoting moral qualities; and it may be remarked that the low, soft tones of gentle and amiable beings, whatever their musical endowments may be, seldom fail to please; besides which, the singing of ladies indicates the cultivation of their taste generally, and the embellishment of their mind."—(*Am. Phren. Jour.*)

"*The American Voice.*—'We were very much struck,' the *Home Journal* says, 'with a remark made to us a few days ago by a distinguished lady just returned from traveling in Europe. She said—by way of expressing an abstract impression of her convulsed country—nothing had so surprised her as the *variety and compass of the American human voice.* The subdued voice of European nations might be "in better taste," but it was wonderfully less ample, less vigorous, less capable of music altogether. The utterance here may lack deference, but it is curiously more joyous, strangely more fearless, and more conscious of power. While she made the remark, (this was at a charming little music party at General Dix's,) a Boston young lady, of private education, went to the piano and gave us a song. It was the finest possible illustration of what could be done with faultlessness of musical skill, at the same time that there was a *naturalness of abandonment* in it all—a familiarizing of the wonderful cadences of a Malibran into the playful accentuation of a joyously unsubdued beauty. Such voices, not uncommon in America, as our traveling friend remarked, "are miracles in Europe!'"—(*Ibid.*)

"*Polypus of the Antrum removed by Facial Section.* By P. Beaubien, M.D., Professor of the Theory and Practice of Medicine in the School of Medicine and Surgery, Physician to the Hôtel-Dieu, Montreal, etc. etc.—L——, a healthy young woman from the country, 32 years of age, was admitted into the Hôtel-Dieu under my care, on the 20th of September last. She is married, and the mother of four children, of which the youngest is but three weeks old.

"Her left cheek is greatly swollen, and she suffers much pain from the presence of a fibrous polypus, situated in the superior maxillary bone. The left lower eyelid is carried upward by it, so as to partially obstruct the view of the eye. The nose is inclined toward the right, and there is quite an enlargement of the lachrymal sac on that side, showing obstruction of the duct from pressure.

"She dates the commencement of the swelling two or three months back, and says that six weeks ago it was quite small, and was removed by a doctor in the country, who found it necessary to abstract two large teeth in the upper jaw, to facilitate the operation. Another growth, however, soon replaced the first, and has been increasing very rapidly ever since; it has now become so enlarged as to make its appearance in two different directions; the more voluminous portion, presenting a convex surface, occupies the whole roof of the mouth. The other, protruding through the anterior part of the superior maxillary bone, is globular, and nearly as large as an egg, and communicates with the portion in the roof of the mouth by a prolongation which occupies the space of the two extracted teeth.

"The necessary operation for its removal was performed on the 25th of September, in the following manner: After placing the patient partially under the influence of chloroform, a horizontal incision was made from the commisure of the lips to the anterior edge of the masseter mus-

cle, and then continued upward, and the external portion of the polypus exposed to view, when the pedicle was found passing out of the maxillary sinus through a large opening, and was detached therefrom by means of a pair of curved forceps. That portion of the tumor in the roof of the mouth, which was held down by adhesions to the internal part of the left gum, as also the prolongation connecting the two portions of the polypus, were now divided, when the whole mass was readily removed entire.

"During the operation but a small quantity of blood was lost, no important vessels being involved. The incision was now brought together by five points of suture, with intervening straps of plaster, and the head was afterward bandaged in the mode usually employed for fracture of the lower jaw. The woman was then put upon strict diet, liquid nourishment only being allowed. The wound united without difficulty, and the points of suture were removed on the fourth or fifth day, as cicatrization had become perfect, except at each extremity of the incision, where there still remained a slight suppuration; this, however, soon afterward ceased. It is now a fortnight since the operation, and the swelling of the cheek has disppeared, the eyelid has returned to its proper position, the lachrymal tumor is lessening in size, and the woman, convalescent, leaves the hospital to-day."—(*Canada Lancet.*)

Fossil Jaw-bones.—"The Abbeville jaw-bone, which raised such a storm a few months ago among geologists, has suddenly received an important reinforcement from a new quarter, MM. Gassigou, Martin, and Trutat having last week announced to the Academy of Sciences the discovery of two new fragments of human jaw-bones, discovered in the cavern of Bruniquel, (Tarn-et-Garonne,) under circumstances clearly pointing to the coexistence of man with some of the extinct species of carnivora, ruminants, and birds. The cavern lies in a mass of Jurassic limestone, and open toward the east at an altitude of about seven metres above the level of the Aveyron. Its floor consist of several successive strata, viz., a stratum of stalagmite, 22 centimetres deep; a pudding-stone, interspersed with bones, to a depth of 150 centimetres; and several black argillaceous strata, to a depth of 120 centimetres, interspersed with a quantity of flint implements and weapons, bones of various quadrupeds and birds, and a quantity of round pebbles, comprising garnets, gneiss, quartz, syenite, serpentine, etc. Lines of charcoal separate some of these layers; and the bones of the ruminants bear marks of having been fractured for the purpose of getting at the marrow, or making them into instruments or weapons; the extremities alone are still perfect, and have enabled the above-mentioned gentlemen to ascertain the species of *Cerves elephas*, *Bos primigenius*, *Rhinoceros tichorrinus*, and several birds, one of these being very large. But the reindeer is the animal which characterizes the age of the cavern of Bruniquel. It belongs to M. Lartet's third palæontological period of the quaternary epoch. The existence of flint implements here would alone be sufficient to prove the existence of man in those distant ages; but this existence is placed beyond a doubt by the discovery of the two fragments of human jaw-bones, one of the right side and the other of the left, but belonging to different individuals. They are both in a bad state of preservation. Among the other fragments of bone there is the humerus of a bird, on which the body of a fish is roughly carved. This seems to have been an amulet or ornament. Ten

witnesses were present at the finding of these relics. Hence it appears that three human jaw-bones belonging to the same type (the brachycephalous one) date from three perfectly distinct periods, viz., that of Aurignac, found in company with the *Ursus spelœus;* that of Moulin-Quignon, accompanied by the *Elephas primigenius;* and that of Bruniquel, found among the bones of the reindeer."—(*Galignani.—Med. Times and Gaz.*)

"*On Transparent Injections.* By Messrs. J. G. Dale, F.C.S., and Thos. Davies.—After enumerating the various desiderata of a transparent injecting fluid, it was observed that soluble coloring matters failed to fulfill them, owing to the action of endosmose, causing them merely to dye the tissue sought to be injected. This defect is shown to be remedied by the use of insoluble coloring matters in an exceedingly fine state of subdivision, which can only be preserved by precipitation under constant agitation, and the following recipe is stated to succeed admirably, showing vessels of $\frac{1}{2000}$ of an inch, with a clear outline even under a $\frac{1}{5}$ objective, without any grain or extravasation of the coloring matter:—

"Take 180 grains best carmine, $\frac{1}{2}$ fluid oz. ammonia, com. strength, S,G, 0·92, or 15 degrees ammonia meter, 3 to 4 oz. distilled water. Put into a small flask, and allow to digest without heat 24 to 36 hours, or until the carmine is dissolved. Then take a Winchester quart bottle, and with a diamond mark upon it the spot to which 16 oz. of water extend. The colored solution must then be filtered into the bottle, and to this pure water must be added until the whole is equal to 16 oz. Next dissolve 600 grains in potash alum in about 10 fluid oz. of water, and add to this under constant boiling a solution of carbonate of sodium, until a slight permanent precipitate is produced. Filter and add water up to 16 fluid oz. Boil, and add this solution while boiling to the cold ammoniacal solution of carmine in the Winchester quart, and shake vigorously for a few minutes. A drop now placed upon white filtering paper should show no coloring ring; should it do so, the whole must be rejected. Supposing the precipitation to be complete, or very nearly so, shake vigorously for half an hour, and allow to stand till quite cold; the shaking must then be renewed, and the bottle filled up with cold water.

"After allowing the precipitate to settle for a day, draw off the clear supernatant fluid with a syphon. Repeat the washing till the clear fluid gives little or no precipitate with chloride of barium. So much water must be left with the fluid that at last it must measure 40 fluid oz. For the injection fluid take 24 oz. of the above colored fluid, and 3 oz. of good gelatine, allow these to remain together all night, then dissolve by the heat of a water bath, after which it should be strained through fine muslin. On injecting, the ordinary precautions for a gelatine injection are alone necessary."—(*Ext. from. Proc. of Lit. & Philos. Soc. of Manchester, Eng.—Quarterly Jour. of Micros. Science.*)

Bending Files.—In answer to a correspondent, the *Sci. Amer.* says:—"You can bend your own files by heating them to a dull red, and striking them with a wooden mallet on a block of wood. Re-heat the file as high as you can without burning it, and plunge into cold water."

Drilling Iron.—The same paper says that "strong soap-suds are just as good to use in drilling wrought-iron as oil."

THE

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ORIGINAL COMMUNICATIONS.

PRACTICAL HINTS.

BY J. D. WHITE.

Diagnosis of Toothache.—We did intend to stop writing on this subject, but it may be pardonable if one short article more is made. It is sometimes a difficult matter to decide the difference between toothache and facial neuralgia. It was remarked, in a former article, that there was much more liability to *pain* at *night* when the pulp was inflamed, than there was from inflammation of the alveolo-dental membranes.

It is not likely that medical men make any distinction on this subject from all we can learn. We have been, during the last twenty years, a great deal in consultation with surgeons and medical practitioners, and we never have in a single instance observed them take the matter into consideration. Toothache was toothache, and if a "*sharp rap*" with a key or a large knife handle did not cause the patient to wince, the tooth was passed as being, to all intents and purposes, sound. Now, every dentist knows that a nerve of a tooth may be exposed and be the cause of great pain, and yet bear as hard a rap of a key or instrument as a wholly sound tooth. If the dentist did not examine cavities of decay carefully, and cleanse them out to discover whether the pulp was affected or not, in how many cases of toothache would the cause be detected? Precious few. If a patient is attacked with pain in the face and does not know of any decay in the teeth, he goes to his doctor, cites to him his case after this manner: "Doctor, I have been suffering all night with a shooting pain all over this side of my head," placing his hand at the left side perhaps. The doctor will at once inquire, "Have you any pain now?" "No," most likely will be the reply of the patient. "How long have you had this pain?" the doctor will ask; "Well, it has been some time, but I did not mind it at

first. I did not know where to locate it; at one time it would be in my temple, then in my ear, and then along my lower jaw; but last night it was all over the side of my face, and kept me awake all night—at least until nearly morning." The doctor then remarks, "This pain is of a periodical character and has been coming on for some time. Have you any decayed teeth?" he would ask. "No," will be the patient's reply, if he has not had a swollen face, or pain in chewing, or taking hot or cold substances into the mouth. The doctor then pronounces it "*a plain case of neuralgia.*" Now, if the patient had called on an intelligent dentist and told the same story and the dentist had asked the same questions, he would have said it was *a plain case of toothache*, from an inflamed or irritated pulp. A case in point may explain.

Case 11.—A few days since, a lady of fifty years of age, sanguine temperament, called to consult us at seven o'clock in the morning. She had been suffering great pain all night, and at intervals for several days. She did not know what could possibly ail her; had frequent attacks of neuralgia in the head, which did not yield to the usual treatment, such as belladonna plasters, aconite, etc. We examined the mouth and found the pulps exposed of each of the second inferior molars on the posterior parts near the gums. Application of the paste relieved the case.

The cases cited in the foregoing papers on the diagnosis of toothache have been referred to, to draw a more careful attention to the subject, and to endeavor to strip many pains and aches of obscurity, and to give young practitioners some few anomalies to judge by, as well as to show how unreliable the locality of pain may be. We cannot depend upon the seat of pain for the cause of it. We have no guide but the pathology of the parts affected. For instance, a patient called a few days since (Case 12) with pain in a first molar, left side, lower jaw, which we had plugged eight years ago, and pain in the ear of that side, for which many things had been applied without affording relief. We found, on examination, that the pulp was exposed in the wisdom tooth of the same side; the pulp was destroyed, when the pain ceased in the first molar and in the ear. For the sake of simplicity we call this *a false reference of the seat of pain;* it subserves the purposes of practical illustration. The pain may be outside of the seat of the diseased organ or inside, that is, it may be toward the extremity of the nerves or toward their roots, or both, and not at any one time located precisely in the tooth affected or the one which is the exciting cause of pain. To obtain a solution of all these conflicting and complicated symptoms involves the study of the nervous system which would be too extended for a journal article; besides, a vast amount that is written is but of a speculative character. The text-books on anatomy and physiology are the only works which afford any satisfactory information, and to them we refer our young readers.

(To be continued.)

SENSITIVE DENTINE AND ITS TREATMENT.

BY C. P. FITCH, M.D.

Read before the Brooklyn Dental Association.

Dental pathological conditions should always suggest to the intelligent practitioner their appropriate medication; it is therefore essential to convalescence that a true knowledge of pathological states be fully apprehended. Not only so, but their causes also should be clearly recognized. The manifestations of aberration from health constitute its true symptomatology. A knowledge of symptoms does not necessarily lead one either to a knowledge of the disease itself or to its cause; therefore, he who medicates symptoms only, is liable to shoot quite wide of the mark.

To enunciate an appropriate treatment of sensitive dentine is a statement which necessarily involves a knowledge of its pathology and causes —for I understand sensitive dentine to mean dentine in a diseased condition—and healthy dentine, whatever other characteristics it may possess, is wanting in this very manifest quality, sensibility. Let us look then for a moment at its pathology.

Unquestionably this structure must come under the general law determining health and disease in other structures of the body. It cannot be placed outside the pale of living structures. And the law touching health and disease, or lesion in other tissues, must apply, if not equally, yet in a modified sense, to this structure also. A very apposite question in this inquiry is, whether there be such a thing as a general law of health and disease; if so, what is it? Or, stated in other terms, what is health and disease?

Aphoristically stated, health is that physical condition which results from the equalness and completeness of the appropriative and eliminative acts; or, in other phraseology, the antegrade and retrograde, ceaseless, molecular activities of the organized being; while disease is its opposite, or the want of agreement between these physiological acts. Dental pathology is unquestionably a lesion in nutrition, whether viewed in reference to original formation or to that condition resultant upon the action of decomposing agents. Its causes are either mediate or immediate. The former exhibit their potency through the general system by poisoning the life-currents, perverting the forces which give character to function, and by establishing, to a greater or less extent, a depraved general condition. The latter exert their influence topically, in conflict with the vital powers with which the structure is endowed. Either class of causes, if at all persistent in their action, affects the other reciprocally by intensifying its force; and when both classes of causes exist, and exert their full influence upon this structure, its decomposition

is rapid and its sensibility greatly exalted. This pathological condition, denominated sensitive dentine, and which is known by the sudden excitation of pain in the part from contact, undoubtedly arises from the antagonism existing between the chemical and vital acts, dominant in the structure for the time, increased by systemic disturbances.

I am fully aware that a nerve organization has been denied this structure, but, to establish this negative point, it is necessary that the human mind be made fully acquainted with everything appertaining to this structure. This cannot be affirmed in reference to our knowledge simply of matter, much less of living, organized matter. No one, perhaps, will deny the existence of a nervous organization at one stage of its development. And who can affirm that calcification of its cells has destroyed or suspended its vital consciousness. We must admit, in reference to the dentine, one of two things: either that it is endowed with nerve fibrilla, so minute, perhaps, as to elude microscopical investigation; or that it is pervaded with its synonym, or, in other words, permeated with that which takes the place of nerve fibre, which position involves the thought that impressions are susceptible of transmission by other than nerve substance. It is possible that the dentine may take on vicarious action and perform the function of nerve substance; while in its transitional state, passing from solidity to semi-fluidity, from the action of antagonizing forces upon its surface and reducing it to a condition simulating original nerve matter, which in its typical form is mucus more or less oxidized or mucoid in its essential characteristics.

The treatment of sensitive dentine, or its medication, is twofold, suggested and determined by the prevalent diseased condition; or, thrown into another statement, its media of approach with remedial agents are either through the general system or directly to the sensitive surface. The application of remedies in either or both of these ways is again determined by pathological states. Where sensitive dentine is attended with a disturbed general condition, the indication calls for the medication of this condition, whether arising from defective diet, lesions—in assimilation and nervous force, or from the presence of mineral, vegetable, and animal poisons. The treatment should consist of a highly nutritious diet: meats, rich in nitrogenous, albuminous, and fibrinous elements; vegetables, replete with the mineral salts, which determine the plasticity of the blood; mineral and acid tonics, iron, phosphates, alteratives, etc. Where this condition is caused by local derangements, they should be corrected, and all foreign matters acting either as irritants, or tending to disorganization, should be entirely removed and excluded from its surface.

As to topical treatment, dressings of an escharotic nature, such as creosote, chloride of zinc, tincture of iodine, etc., may be applied directly to the diseased structure. Such agents obtund, either by diminishing and

increasing the organizing force, as the case may be, or by increasing the disorganizing force, thereby driving out the conscious entity from the superficial cells, thus rendering their removal with a sharp instrument quite painless. Chloride of zinc should be left in the tooth but a few moments, whereas creosote, the tincture of iodine, and opii may be left in many hours, and even days, with the happiest results. A sharp instrument in the hand of a dextrous, intelligent operator is, perhaps, good local treatment for the removal of that portion of the diseased structure necessary to be removed prior to plugging the tooth. But it should ever be borne in mind that the presence of metallic stoppings in a highly sensitive tooth will tend to increase this pathological condition, if its cause be constitutional; and under these circumstances, unless medication be resorted to, thermal changes will in a majority of cases eventuate in the premature death of the pulp.

Having indicated in this paper general principles, I leave it for you, gentlemen, to make their individual application.

NEW YORK, December 23, 1863.

"MISCELLANEOUS."

BY WILLIAM H. ATKINSON, M.D.

Read before the Society of Dental Surgeons of the City of New York.

No caption can be more appropriate for the regular or irregular discussion of the "mixed" subject of dentistry.

It is said that we are a "miscellaneous medley of ignorant and erudite geniuses;" and a survey of our works and ways will go far to substantiate the assertion. For, indeed, he who would fulfill the various demands made upon the dentist in this country, must embody within himself more of versatility of knowledge and skill than is required by any other single profession or trade known to our times.

A just classification of the ignorant and the erudite would place most names on both lists. For our knowledges and acquirements are so fractional and disconnected, that in some things the best must be but novices, while the merest beginner is in possession of some of the most advanced and useful knowledge and power of execution known or possible to any of us. There is probably no one in the whole range of the profession who knows or has found his true comparative status among us. And this is well for both the primal and the most advanced, as it holds out hope of attainment to the former, and stimulates the latter to continuous effort and struggle, to compass the most serious obstacles in his way in the same spirit of emulation as he would, were he advised that a thousand others were his equals and struggling for the victory over the same enemy.

There is but one insurmountable obstacle in the way of the earnest dentist, and that is satisfaction with present attainment. Just so soon as we account ourselves as having attained all that it is possible to acquire in any direction, the death knell of ambition in that direction has struck its final note; to advance is simply impossible until we are converted from the accursed hallucination. It has been said long since, "what man *has* done, man MAY do;" let us not tarry in such puerility, but assert the aphorism of the coming time, and say "that which man can conceive man is able to accomplish!"

Then we shall have ignited the fuel which will generate the steam that shall bear the car of progress far beyond the confines of what has been deemed the passable limit of mere human wisdom and effort.

Do any ask why such confident prediction of success and assertion of inherent power is made? Let the past reply to the full vindication of the wildest prophesy! Have not the pioneers of every department been deemed impracticable and useless weights upon the body politic? when in fact were it not for this very "delirious" "confidence" of theirs in the discoveries they made, the world would this day be in the veriest primal savagism!

Then, if the great temple of knowledge is adequate to a demonstrable reply to every possible suggestion arising within the sentiency of man, why shall we persist in ransacking the obsolete philosophies, before we dare acknowledge the demonstrations as legitimate? If we see the demonstration, there it stands a patent fact; and if we do "*not see it*," all the indorsement of all the past will fail to make it true or useful. All philosophy has to find pronouncement for the first time, and hence has to pass the ordeal of demonstration, first before the court of the mind of the discoverer or convert, and then that of all those singly or collectively who are to be inducted into it.

To what, then, does dentistry as a science and art owe its unprecedented acquisition and elevation? Probably no one circumstance so powerfully contributed to this as the unobstructed condition of the field. While all else, save only mathematics or the science of numbers, that lays any claim to the dignity of science, has been weighed down by precedent and authority to a degree next to exclusion from anything like progress, this new soil has brought forth abundantly under even the rudest attempts at culture, because of its freedom from deleterious and exhaustive former methods of taxation upon its productiveness.

Now, let us take warning in time, and not bind ourselves to even our brightest attainments and clearest demonstrations for the time as ultimates beyond which it is not possible for any to go, or we shall soon find, not that we have retarded dental progress, but that we ourselves, from being pioneers in the good cause, have become but fossiliferous waymarks of the advancement of the body we had presumed to limit in capa-

city for improvement and elevation in honor and usefulness, as, alas! has been the experience of many who "did run well for a season!"

If it were asked, why inventions and discoveries had to pass the incubation of one or more generations in Europe, while many have been quickly and cheerfully recognized and adopted in the United States, the reply will throw some light upon the query, why dentistry has so wonderfully sprung into importance, first here, and then in old conservative Europe! It is, that in Europe (and in our own older schools) men are taught to look out of themselves for authority and indorsement; while young America, *feeling* the divinity stir within him, deems the demonstrations to his apprehension as certain as those that are accredited by the authority of the "preacher," and spontaneously acting upon his conviction, has proved the soundness of his deduction by his marked success, and thus dethroned the false authorities and lessened the reverence for the true, because it had allowed itself to be overshadowed by the false. And just as America has taught Europe new lessons in statesmanship, so dentistry is teaching her mother, surgery, to be more regardful of the intimate relationships and paramount importance of hitherto slighted organs, without which we can have no wholeness of function in the human body.

Dentistry, thank a progressive Providence and an earnest few, is taking its proper place as a profession. The world always crucifies its saviours at their first advent, because they cannot indorse the errors of the past, which they are required to do or submit to the fate of malefactors. The only difference between the past and the present in this respect is, we run through the stages of development at an increased impetus now, so that a pioneer may live to see of the travail of his soul during his personal career among men on earth; while they of the former times had to content themselves to be appreciated by posterity.

In this the ancients had the advantage of the moderns in one sense—that of complete devotion to their purpose, which polarized their sentiency, and they thus floated the higher above their contemporaries and their charge.

A habit of thought, reflection, and demonstration, like the repetition of the manipulations incident to our daily duty, facilitates and accelerates the exercise, and renders more certain and definite the result. That which at the first was barely clear enough to gain our credence, at length becomes strong enough to possess us so fully as to preclude the desire of indorsement of any mind whatever; and we at once set about trying to communicate the newly-found treasure to our fellows, whom we are often astonished to learn are unprepared to apprehend the demonstration which has set our souls all ablaze with joy at the unfolding beauties of the subject before us.

Be assured, my beloved brethren, that habit has much to do with us in

all departments of our natures; therefore let us see to it, each one for himself, that all his habits are such as he can approve without a but or a minus in the moments of his highest inspiration, and my word for it, this body will soon be a power for good, felt and cheerfully acknowledged by all who know us as we really are in purpose and life!

I said, "there was but one *insurmountable* obstacle in the way;" I now say, there is another obstacle which is, alas! too commonly *not surmounted* by the great mass of workers in our body. I refer to the desire and willingness on the part of novices and beginners to receive the remuneration at very early stages of our professional career which is only due to extended knowledge and surpassing usefulness, which practice has its antipodes, like all else in this world, in those who really do a substantial service for unremunerative returns.

Both result from an overestimate of mere *money* and underrating a truly redemptive service, which really is incapable of admeasurement by dollars and cents.

In view of all our surroundings, how shall we conduct ourselves so as to meet the demands of our high mission, and thus increase in usefulness commensurate with the miscellaneous necessities before us?

Let us begin from this hour not to accept or adopt anything we do not understand, no matter from what source it comes, nor, on the other hand, reject as unknowable or useless the range of propositions too dark or too deep for present comprehension; but set down all unproved problems and assertions as things held under judgment, until demonstrated to our personal satisfaction to be worthy of acceptance or only fit to be cast aside as profitless altogether.

Neither let us defer the investigations of the miscellaneous and apparently loosely-connected propositions presented to our inspection, from the low or high estimation in which they may be held by those combating or those defending them.

With this clean purpose as a pole star, we will individually be able to judge of the relevancy or impertinence of any subject before us, and be our own judges when to accept, postpone, or reject any and all matters claiming our attention, without the necessity of casting about us to see whether it will be profitable or popular among those who have been regarded or assumed to be authority upon which to hang in cases of darkness and doubt, thus becoming ourselves masters of the situation, and not liable to be taken aback for assuming to exercise a power we did not possess.

December 30th, 1863.

THE RELATIVE CLAIMS OF OPERATIVE AND MECHANICAL DENTISTRY.

BY C. P. FITCH, M.D.

Read before the Society of Dental Surgeons of the City of New York.

THE fact is quite apparent that each department of dental practice has its own specific claims and demands certain qualifications on the part of those assuming the practice of either specialty. While this is apparent and its truthfulness readily conceded, it is not quite so clear in the minds of many gentlemen of our profession that the dental practitioner should manipulate in one or the other of these departments exclusively.

While we assume the affirmative of this statement, the conviction does not press heavily upon us, that there exists any occasion for self-congratulation, or for instituting invidious comparisons, or for setting up claims of exclusiveness, by gentlemen officiating in either branch of practice, on account of superiority of intellection or of acquisition. Admitting that this, in a certain sense, may be so in an extremely limited number of cases, yet with many assuming this it will be found to be more fancied than real when subjected to catechetical tests, the *experimentum crusis* for all such assumptions. But, on the contrary, there is really an occasion for self-humiliation, and for the exercise of a spirit of uniform docility on account of the little that is known by the wisest among us, in comparison to the much that may and is destined to be known in the extended fields of dental research in reference to both its principles and practice. Indeed, the initiatory steps, in the curriculum of study, should commence with basal principles, and embrace, in its ever-widening circumference, all that can contribute to, or in any sense constitute, the requisite qualifications for practice in both the operative and mechanical departments. So far as qualifications, fraternal recognition, and equality of position are concerned, the profession should be, and really is, a unit; but in reference to practice it should be dual: its requirements seem to point to a division of labor and effort. There are reasons why this is so, growing out of the nature of the practice inseparably connected with either branch of the profession.

We turn our attention then, briefly, to a consideration of the claims or duties connected with these respective departments.

In a peculiar sense, operative dentistry is mechanical; but its efficient practice supposes prerequisite gifts, natural and acquired, which partake largely of philosophy and science; while mechanical dentistry, proper, requires for its highest development gifts and acquirements which entitle its representatives to eminent distinction and rank as machinists and artists. The operative department has to do with the conservative and radical treatment of oral diseases, the arrestation of dental decomposi-

tion, and the restoration of lost dental substance by the application of appropriate agencies to the natural dental organism; while mechanical dentistry calls upon its votaries to produce an artificial organ that will adequately substitute the loss of the natural, and the proper adjustment of the artistic product in its designed locality to subserve and simulate nature in utility and appearance. The specialist of the former should be conversant with nature's ever-varying normal and abnormal phases; should be familiar with her manifest and occult forces; should have at his command ample and specific remedial agencies and a knowledge of their legitimate application. The latter should understand all of nature, organic and inorganic, that he may make a suitable dental substitute whenever called to its performance. The one studies nature in order to protect and preserve her; the other studies nature that he may reproduce her.

The general acquisitions, requisite for efficiency in either department, do not materially differ; yet, in some specific sense they may, and doubtless do, differ. But the application of knowledge and gifts in the detail of manipulation *widely* differs. It is then in the line of practice, in operative and mechanical dentistry, that difference more particularly obtains, and that suitable natural gifts, and especially acquired fitness, are of the highest importance.

The practitioner of the former should be, in the highest sense, a mechanico-philosopher; able to originate, acquire with facility, and apply, in a practical sense, truths which constitute science; competent to suitably arrange and naturally group those truths which establish a fact or law; and apt in associating and comparing those general facts which, in the aggregate, are really the essence of philosophy. He should possess, in a marked degree, practical common sense; be endowed with quick perception, with nice discrimination, that natural relations and conventionalisms may be discerned and detected at a glance; but, in an important sense, he should possess more than ordinary manual dextrousness, that he may meet with promptness and perform with aptitude the heroic and finer manipulations incident to his calling. In order to command respect and maintain supremacy here, upon this the toil and recreation ground of his life's activities, it is quite important that he be self-possessed, firm but gentle, respecting, with becoming deference, the opinions of others, and yet maintaining his own views and convictions with earnestness and commendable zeal.

The practitioner of the latter specialty, whether he combines and presents in his complex being the highest endowments of philosophy and science or not, should be, in the fullest sense, a mechanico-artist. He should embody those qualities, and give practical demonstration of their existence, in all the products of his art, which would entitle him to confidence as a machinist and to eminence as an artist, in the reproduction

of lost featural expression, there being present, as it were, but a few pieces of the skeleton of former expressional life from which to reconstruct the habitat of the spiritual entity, the soul's material representation. He should be familiar with nature's varied products, with chemical affinities, the laws of aggregation and segregation; should possess a nice appreciative sense of form, size, color; understanding the profound knowledge of temperaments, which determine, to a great extent, the character of the teeth to be supplied, and expert in the philosophy and practice of mechanics. Possessing such knowledge, and having such means and appliances at hand, he certainly should not fail, in any essential point, in meeting, to some considerable degree, the demands of his special calling. There are some, indeed, that ply their vocation in this department, that never have and never will originate anything. They live, fatten, and flourish upon the brain-products of the few. They cannot really be called mechanical dentists. The application of this term, so far as they are concerned, is certainly a misnomer. If these remarks are true in reference to some in the mechanical department, what must be said, if the truth were to be spoken, in reference to many in operative dentistry? Gentlemen, I cannot do justice to this subject without committing offense, and as I wish, in all charity, to forbear giving pronouncement to remarks caustic or severe, I pass this thought, at least for the present, in silence.

But there is a practical phase of this subject which demands a moment's investigation. It is in a practical sense that the operative and mechanical departments should be kept quite separate and distinct: such a wide difference obtains, just here, that it seems almost indispensable to the attainment of eminence and high development in either, that exclusiveness be rigidly adhered to.

I do not use the term exclusiveness in its offensive sense, but simply to indicate a given line of practice. He who would reach distinction and desire to have his name associated with pleasant memories, or attain usefulness, in its highest and most extended sense, must concentrate his thought and energy in one or the other of these practical departments.

Many representative men in our profession, both in the past and present, could be referred to as fully sustaining and illustrating this position. In the minds of many, especially those having a small business, there exists good and sound reasons why these two branches should be united. But I cannot conceive of an instance, unless it be found in the fact of a very limited practice, and in a locality in which it is practically impossible to secure additional services, (and certainly this latter reason will not apply to our cities,) where it would not be better for patient and operator to keep them quite distinct. If any reasons are valid, the two just alluded to seem to take the precedent; but, even under these circumstances, it would be better for the operator, in reference to the former, simply to superintend the manipulations in the mechanical; and

in relation to the latter, to make arrangements for procuring the requisite help as soon as possible.

Young men should be educated, true, in broad general principles, but, especially, with one or the other of these departments in view.

It is, indeed, quite inopportune to be called from the laboratory with hands immersed in sand and plaster; roughened and abraded by contact with its furniture and appliances, losing that nice sense of palpation so highly requisite for rendering delicate services; or with person besmeared and ill at ease from sundry contacts with that which is sure to leave its mark and remain somewhat indelible, but which, legitimately considered, is the insignia of commendable industry, of honorable and honest toil, and only in this instance unpleasantly noticeable because sadly out of place; or with the mental and physical nature intensified and heated to the soldering point,—I say it is quite inopportune, under these circumstances, to be called upon to meet demands of an operative character. Not only is the operator, at such times, incapacitated for rendering efficient service in that which requires precision and delicacy of touch in its elaborateness and detail, the highest states of finish, resembling nature in its results, which often is, and always should be, the embodiment of the operator's highest conceptions, but the delicate mucous surfaces must suffer and pay the penalty of such inconsiderate practice, and the feelings of the patient must be painfully outraged at the manifestation of such an utter want of physical fitness for the performance of so delicate and important an operation. Therefore I can see no occasion, whenever this subject is mooted, (for really there none exists where it is properly understood,) for the indulgence, on the part of any one, of unpleasant and improper feelings, or for an expression of bitter, reproachful language for supposed or claimed superiority of the operative to the mechanical; for he who sets up such a claim is decidedly fractional as it regards mental caliber and acquisition, and consequently his erroneous position has very little claim to either respect or notice. On the contrary, I can see many valid and sound reasons, founded in fact and requirement, why the practice of the operative and mechanical in dentistry should be exclusively pursued by different gentlemen of our profession.

In closing these few thoughts, gentlemen, I sincerely hope that a laudable ambition for superior excellence, respecting results, will ever characterize, nerve, and stimulate every aspirant in either specialty, and that the fraternal feeling now so prevalent in this society, and cropping out so abundantly all over the land, will ever maintain the ascendency, so that an honest expression of opinion, or even the contact of offensive contrast, either upon this or any other subject, may never tarnish our fair fame, neither destroy nor check the manifestation of reciprocal regard, or mar, in the slightest degree, the good time now enjoyed, and in the coming future sure.

New York, Jan. 1864.

THE PEOPLE'S DENTAL JOURNAL.

BY R.

It is perhaps already well known to many in the profession, that the above title applies to a very neat little Quarterly Journal edited by Dr. W. W. Allport, and published at Chicago, Ill. This publication, designed for the instruction of the people in all matters relating to our specialty, which can in any way profit them, is so intimately interwoven with the best interests of the profession generally, that a more extended and conspicuous notice of it than has yet been given would seem not altogether uncalled for.

The People's Dental Journal is, we believe, the first periodical of the kind intended for general circulation ever published in this country, and Dr. A. has entitled himself to the gratitude of the profession for the conception and execution of the design, and the attractive manner in which it has been put before the people.

In this undertaking, the editor has already been liberally assisted by a few gentlemen well known to the profession, who have volunteered an interest in the enterprise, and the number of these will doubtless be augmented, as the objects and character of the Journal become better known.

The subject of the best means of informing the popular mind upon matters relating to our profession has been one of anxious inquiry and discussion, and its importance can scarcely be overrated. We think it will be conceded that the instrumentalities heretofore employed, though in some measure successful, have not fully answered the requirements of the profession. The practitioner who is ambitious to impart information, will never lack opportunities in his intercourse with patients at the chair. Much may be, and is, accomplished in this way, but not all that is desirable. Both the operator and patient's thoughts are too much distracted, by the nature of the services which the former is called upon to render, to admit of that thoughtful deliberation on his part, or that earnest and undivided atttention on the part of the patient, which such instructions require. Besides, information imparted orally must always, in the nature of things, lack that comprehensive scope in individual cases necessary to bring the patient fully up to the requirements of the profession.

The issuing and distribution of office pamphlets, circulars, etc., as a means of educating the people, has been resorted to with some degree of success, but much is necessarily omitted in this way essential to be done. A limited number only of subjects can be presented, and these necessarily imperfectly elaborated within the compass usually assigned them, while the sameness of style detracts from the interest imparted by diversity in this respect. The subjects proper to be brought to the attention of the people are so multiplied and comprehensive in their character, that no one individual practitioner, enjoying a full practice, would either

have time to prepare the matter, or be willing or able to incur the expense of publishing it. A periodical publication, however, designed for general circulation is, or ought to be, self-sustaining, while its pages will reflect the opinions and thoughts of a large number of minds throughout the profession; insuring the greatest variety, instruction, and interest to the reader. It goes to the people in installments; always fresh and attractive, and will be carefully and thoughtfully read, and mentally digested, when other publications of a local character, and having the odor of an advertising medium about them, would be carelessly perused, or thrown to one side.

The suggestion which of late has been repeatedly urged upon the profession, and to some extent practiced, of communicating information to the people through the public press, is one which we have always thought of questionable policy. It could only have been recommended in the absence of something better, and is a gratifying evidence, at least, of the growing interest taken by the profession in this subject. The necessity of communicating with the people through this channel no longer exists. The *something better* has been found, and the solution of a vexed problem is discovered, in publications similar to the People's Dental Journal. It can hardly fail to present itself to every one as the least exceptionable and most effective means of attaining those important results which every true man in the profession has earnestly at heart.

If what we claim for this Journal as a means of communication with the people is granted as true, it is the plain duty of the profession to encourage and support it. Every reputable dentist should not only place copies of it in his reception-room for general reading, but should make an effort to put it in the hands of as many of his patients, and others within the field of his practice, as possible; and, if circumstances permit, to provide those with it gratuitously who are unable, and many even who are at first unwilling, to take it. No less is the obligation to encourage it by contributions to its columns.

We may inveigh against the ignorance, indifference, and credulity of the people in matters relating to our calling, and condemn the popular judgment that fails to distinguish between the worthy and the cheat, but the profession cannot proclaim itself innocent of the people's want of intelligent appreciation of the nature and value of dental services, until it has made some more general, thorough, and systematic effort to supply them with instruction than heretofore. We cannot conceive of any more effective antidote to quackery, than the general circulation of journals similar to the one under consideration. They bear about the same relation to quacks that arsenic does to rats—both being destructive to *vermin.* While such publications are something that every well-meaning dentist will rejoice to place upon his office table for perusal, it will never be found accessible to the patrons of thieving impostors and mountebanks. In a pecuniary sense, it would be deliberate suicide for these unscrupulous

pretenders to place such a work in the hands of their patients; and this we take to be the highest encomium that could be awarded such publications.

It is perhaps unnecessary to disguise the fact that, outside of quacks, there are some in the profession who are indifferent, if not actually hostile, to the success of this venture, on the purely speculative ground that it has been projected mainly in the interests and for the personal advancement of the gentlemen with whom it originated. We believe this assumption, ill naturedly conceived, to be erroneous, and eminently unjust to the editor. If its publication shall add anything to his already well-earned reputation, we may, I think, in consideration of the common benefits which it promises, reconcile ourselves to what is so usually and properly associated with the performance of meritorious acts, namely, the favor and approval of our fellows.

We speak advisedly, and as one admitted somewhat fully to his views, when we express the conviction, that not any one in the profession is devoted more unselfishly, or with greater zeal and singleness of purpose, to the general advancement of his calling, and especially to the cause of popular dental education, than the pioneer editor of the People's Dental Journal. The profession have, in the known character of Dr. A., the fullest assurance that the publication will not, under any circumstances, be diverted from its expressed and legitimate purposes.

GREAT CENTRAL FAIR.

UNITED STATES SANITARY COMMISSION,

PHILADELPHIA AGENCY, No. 1307 CHESTNUT ST.,

March 1, 1864.

THE undersigned, members of the Executive Committee of the **Great Central Fair for the Sanitary Commission**, beg to invite the co-operation of all their fellow-citizens, especially of those resident in Pennsylvania, Delaware, and New Jersey, in this important enterprise. It is proposed to hold the Fair in Philadelphia, in the *first week in June next*,

and it is confidently expected that the contributions, coming from a population so benevolent and patriotic as that which inhabits the Central States, and representing the most important and varied branches of industry and art, will secure a result in aid of the funds of the Commission, and for the benefit of the Soldier, at least equal to that which has attended similar undertakings in other cities. It is not necessary to say a word to stimulate sympathy for the soldiers. We feel for them all as brethren, and the popular heart seeks only the best mode of manifesting that sympathy in the most efficient and practical way. These Fairs in other places have been productive of great results. By this means Chicago has recently raised for this object sixty thousand dollars; Boston, one hundred and fifty thousand; and Cincinnati, more than two hundred thousand. We appeal, then, with the greatest confidence to the inhabitants of the Central States, especially to those who constitute the great industrial classes, to send as contributions the productions of their skill and workmanship. We appeal to them in the interest of no party, radical or conservative, Republican or Democratic, Administration or Anti-administration. We know only this, that to send our national soldiers in the field supplies to supplement those Government undertakes to give them, but which they sometimes fail to receive, and thus to relieve them when sick and in misery, is a work of Christian charity, and that it is a work of intelligent patriotism also, as economizing their life, health, and efficiency, on which, under God, the nation depends in this its time of trouble.

We therefore ask every clergyman to announce this humane undertaking to his people, and to advise them to do what they can to further it. We ask the press to give it the widest publicity and the most earnest encouragement. We call on every workshop, factory, and mill, for a specimen of the best thing it can turn out; on every artist, great and small, for one of his creations; on all loyal women, for the exercise of their taste and industry; on farmers, for the products of their fields and dairies. The miner, the naturalist, the man of science, the traveler, can each send something that can, at the very least, be converted into a blanket that will warm, and may save from death, some one soldier whom Government supplies have failed to reach. Every one who can produce anything that has money value is invited to give a sample of his best work as an offering to the cause of national unity. Every workingman, mechanic, or farmer who can make a pair of shoes, or raise a barrel of apples, is called on to contribute something that can be turned into money, and again from money into the means of economizing the health and the life of our national soldiers.

Committees have been appointed in each department of industry and art, whose business it will be to solicit contributions for the Fair, each in its own special branch. These Committees will place themselves in

communication with those persons who may wish to aid us. In the mean time, it is recommended that Local Committees or Associations should be formed in every portion of Pennsylvania, Delaware, and New Jersey, with a view of organizing the industry of their respective neighborhoods, so as to secure contributions for the Fair.

Committees of ladies have also been organized to co-operate with those of the gentlemen in soliciting contributions.

A list of these Committees will be shortly published and distributed. In the mean time, those who are disposed to aid us, or who may desire any further information on the subject, are requested to address the Corresponding Secretary of the Executive Committee of the Great Central Fair, 1307 Chestnut Street.

JOHN WELSH, *Chairman.*
CALEB COPE, *Treasurer.*
C. J. STILLÉ, *Corresponding Secretary.*
H. H. FURNESS, *Recording Secretary.*

W. H. Ashhurst,
Horace Binney, Jr.,
A. E. Borie,
N. B. Browne,
John C. Cresson,
D. B. Cummins,
Theodore Cuyler,
Frederick Graff,
J. C. Grubb,
Joseph Harrison, Jr.,
R. M. Lewis,
S. V. Merrick,
B. H. Moore,
J. H. Orne,
John Robbins,
William Struthers,
William M. Tilghman,
George Trott,
Thomas Webster,
George Whitney,
George A. Wood,
George W. Childs.

The undersigned have been appointed a Committee to represent

DENTISTRY, ARTIFICIAL TEETH, GOLD FOIL, DENTAL AND SURGICAL INSTRUMENTS,

in the Great Central Fair, to commence in this city in the first week in June next. It will be held under the management of the Executive Committee of the Philadelphia Associates of the United States Sanitary Commission. Its object is set forth in the accompanying Circular, and so commends itself to our sympathies and affections as to require no argument or appeal to secure the co-operation of all who may be able to advance the object in view.

In the particular field of labor assigned to us, there is less opportunity for the contribution of articles for sale than is afforded in most other departments of industry; therefore our *principal* dependence, in the effort to have the Dental Profession and its auxiliaries properly represented among the various classes of contributors, must be upon donations in

cash. Nevertheless, we earnestly desire that those to whom this Circular is addressed shall feel such an interest in the cause as to be willing not only to contribute of their means in its behalf, but also to use their influence in their own localities, by soliciting donations of any kind that may be converted into money. Contributions in cash may be sent to either of the Committee, which will be acknowledged in the DENTAL COSMOS, and receipts returned by mail.

All *packages* should be marked "GREAT CENTRAL FAIR;" and notice should be given to the Chairman of *this Committee*, how and when they were shipped, their value, and whom they are from.

All articles will be exhibited with the name and locality of the contributor.

DR. J. D. WHITE,	DR. DANIEL NEALL,
" C. N. PEIRCE,	" J. H. MCQUILLEN,
" E. WILDMAN,	" C. A. KINGSBURY,
" JOHN MCCALLA, Lancaster, Pa.,	" J. L. SUESSEROTT, Chambersburg, Pa.,
WILLIAM ABBEY,	JOHN WEIGAND,
H. G. KERN,	J. H. GEMRIG,
C. L. ORUM,	GEORGE SNOWDEN.

SAMUEL S. WHITE, *Chairman*,
No. 528 Arch Street.

NITROUS OXIDE GAS AN ANAESTHETIC.

BY G. Q. COLTON.

THERE are probably a thousand dentists in the country now using the nitrous oxide gas as an anæsthetic for the extraction of teeth. It is of the first importance to these, and others who may contemplate its use, to know whether it is a *safe* and *efficient* agent for the relief of pain. Very little knowledge can be obtained by reasoning upon the chemical properties of an agent. It can only be decided by actual experiment. Since the introduction of the gas as an anæsthetic at New Haven, in May last, I have watched the result of its use with scrutinizing interest. Only three deaths have been "reported" as having been caused by it. These were Mr. Sears, of this city; Miss Bell, of Swanton, Vt.; and a lady (name not given) in Allentown, Pa. These three, I believe, embrace all the deaths which are asserted as having been caused by the gas. I have taken some pains to ascertain the facts respecting these cases.

In regard to the death of Mr. Sears, which occurred two hours after he had apparently recovered from the effects of the gas, the medical profession of this city entirely concur in the opinion expressed in the *Medical and Surgical Reporter*, as follows: "From the pathological condition of the lungs of the patient, we have little doubt that the same

result would have followed the extraction of the tooth if no anæsthetic had been taken. When a person has so slight a hold on life as this man had, so insignificant a circumstance as the extraction of a tooth will often so derange the nervous and circulatory systems as to occasion the congestion which caused the death." There is certainly, in this case, no evidence that the gas is not a *very safe* anæsthetic.

In order to get the facts regarding Miss Bell, of Vt., I wrote a letter of inquiry to Dr. L. Gilman, of St. Albans, a gentleman of high standing and integrity. (This case is noticed in the last number of the DENTAL COSMOS, by an extract from the *New York Tribune.*) Dr. Gilman informs me that Miss Bell inhaled a small dose of the gas "for sport, (not for anæsthetic purposes,) with several others on *Friday* afternoon, Jan. 29th. Came out of it as well as any one ever does. Attended a party the same evening; as well to all appearance as ever; full of life and frolic; was taken sick the next day [Saturday] and died on the *Wednesday* following." These facts are fully corroborated by the *St. Albans Messenger*, which calls her disease "inflammation of the meninges of the brain and spinal cord." No coroner's jury was summoned, and the people of the town had no idea that the gas had anything to do with her death. A great noise has been made about this case, (at a distance from where it occurred,) but we find upon investigation that the lady entirely recovered from the effects of the gas, *attended a party in the evening*, and died *five days* after being taken sick.

The Editor of the *Tribune* informs me that the same pen which wrote the paragraph (not one of the editors) copied by the DENTAL COSMOS, wrote the account of the *third* death, published in the *Tribune* of Feb. 26th, respecting the death of "a very healthy" young lady of Allentown, Pa., from the effects of "laughing gas." I have ascertained that in this case the lady breathed *chloroform* instead of nitrous oxide. Not knowing any one in Allentown, I wrote to the postmaster, asking him to hand my letter to some good physician, with the request that he would give me the particulars. I received the following reply:—

"ALLENTOWN, Feb. 27, 1864.

"DEAR SIR:—Your letter desiring information is received. An answer is most cheerfully given. *Chloroform* was the agent that produced death in this case, which happened some time back, in the office of one of our most respectable dentists. It was administered, I believe, carefully, by two physicians of good standing in this place, and the quantity given not large, and the patient apparently healthy, which goes far to show that it is an agent that kills at times, and quite unforeseen and unexpected. Of late I have entirely refused to give it in the extraction of teeth.

"Yours respectfully,

C. L. MARTIN."

We thus see, that by an investigation of these deaths, not one of them has been caused by the nitrous oxide. Having administered this gas during the past twenty years to tens of thousands, and since May last to several thousands more for *anæsthesia* in the extraction of teeth, without observing any ill effects, I was unwilling to believe that these deaths *could* have been caused, either by a small or a large dose of the nitrous oxide. From the fact that the gas has been so extensively used, and by men who know nothing of chemistry, and who do not always make so pure an article as they should, is it not apparent that it is far the safest anæsthetic known?

In the last number of the DENTAL COSMOS is an extract from the *Medical Times and Gazette*, which contains a notice of the symptoms attending fifty-one cases of "death from chloroform," and in which the following passage occurs:—

"What is to be done in cases of threatened death? There is only one stimulus to the failing heart—the stimulus of aerated blood; and the only means of producing this is by the excitation of respiration." A note at the bottom of the page adds:—

"Arterialization and respiration can be most readily induced in asphyxia by *nitrous oxide*, either in its gaseous forms through the lungs, or condensed in water and introduced into the alimentary canal by the mouth or bowels."—Dr. Ziegler.

There is *sound sense* in this! When chloroform is given, it is only necessary to have a quantity of nitrous oxide on hand, so that if the patient is carried to asphyxia or death's door, he can be *restored to life* by giving him a dose of the nitrous oxide. In the use of chloroform, the person dies, (if at all,) not more from the direct effects of the chloroform than from the lack of oxygen. Chloroform contains nô oxygen, while the nitrous oxide contains *more* oxygen than the common air; one-third instead of one-fifth. It is composed of the same elements as the air, only a larger proportion of oxygen, more of that which imparts life to the blood and to the whole system. In using chloroform, the pulse gradually runs down, and if carried too far ceases entirely, as also does the breathing. This result is owing to the lack of oxygen, and hence the nitrous oxide forced into the lungs would be the most effectual remedy.

But what do the "authorities" say about the *safety* of the nitrous oxide as an anæsthetic? Sir Humphrey Davy, the father of this gas, says, (see February DENTAL COSMOS:) "As nitrous oxide in its extensive operation appears capable of destroying physical pain, it may probably be used with advantage in surgical operations in which no great effusion of blood takes place." Here is a clear enunciation of the anæsthetic powers of the gas made nearly sixty-five years ago!

Prof. Benjamin Silliman, Sr., in his last work on chemistry, says: "It may be breathed without injury, but it produces a remarkable excitement

in the system, amounting to intoxication, and, if carried far, to *insensibility.*" Here again the anæsthetic power of the gas, as also its safety, is distinctly announced.

Prof. R. Ogden Doremus, of the New York Bellevue College, said, in his last lecture, recently given in the Cooper Institute, on the "World's Progress in Science," (as per *New York Times* report:) "Aside from the common air, there is no combination of oxygen and nitrogen which can be safely breathed, except the nitrous oxide, or laughing gas. This gas was entirely harmless in its effects, and while a small dose would exhilarate, a larger dose would induce anæsthesia or sound sleep, during which the most painful surgical operations could be performed without pain or the knowledge of the patient. He then took a few inhalations of the gas, though not to the point of exhilaration."

A few days since I administered the gas to a boy 11 years of age, and by alternating it with the air, kept him in a profound sleep for three minutes, during which time Dr. W. H. Atkinson removed a piece of bone from the leg six inches in length. The operation was skillfully performed. On opening his eyes, the little fellow asked, "When are you going to take out the bone?"

While I claim that the nitrous oxide is a very safe anæsthetic if made pure and properly administered, I admit that there may be rare cases and conditions of the system in which it would be injudicious to give it.

New York, March, 1864.

A VOICE FROM THE "PACIFIC SLOPE OF THE ROCKY MOUNTAINS."

BY J. D. ANDERSON, D.D.S.

There are few men in the dental profession for whom I entertain a higher regard than for Dr. Wm. H. Atkinson. His attainments and skill entitle him to a position in the ranks of first-class dentists, and his industry and progressive spirit command the admiration even of the old fogies and drones of the profession, who are ever ready to denounce as visionary and utopian the pioneers of progress.

But I must take exception to a statement of the doctor's, in his report of one of his "hopeless cases," which was published in the Dental Cosmos of January, and in which he made a reflection upon the dentists of the Pacific Coast. It reads as follows:—

"At the suggestion, and by the *request*, of Dr. R. H. McDonald, of Sacramento City, Cal., I propose to give the statement of his own case, which was regarded as 'hopeless,' so far as restoration and retention of the six upper front teeth were concerned, by the best skill on the Pacific slope of the Rocky Mountains."

I infer that the meaning of this statement, in plain English, is, that the

best dentists on the Pacific Coast considered Dr. McDonald's teeth too far gone to be preserved. I do not know that we should feel much aggrieved, however, as Dr. W. H. Atkinson, after explaining the *modus operandi* by which he restored these abraded teeth to usefulness and symmetry, tells us that he knows of only two (himself being one) "who are doing this sort of work." Shades of Harris and Townsend, how degenerate are your children! But let me say for the dentists of California that this "statement" of Dr. Atkinson does them great wrong. The idea is suppositional and imaginary, and that "this sort of work" is done here every day, *with and without the use of the mallet.* I was not aware that it was a very new thing to engraft a gold crown on the root of a tooth, as I was taught how to "do this sort of work" in a dental college in the winter of 1859–60. I will state that I have seen the fillings referred to in Dr. McDonald's mouth, and have the candor to admit that I have never seen them surpassed, but the same honesty compels me to say, though it may pique the overweening confidence of Dr. W. H. Atkinson, that, in 1859, I examined several "solid, gold, fractional crowns" in the mouth of a gentleman, who said they were inserted by a dentist in Florida *nine years before that time;* and will also state that I have patients living in this city who have been masticating on such fillings that I inserted two years ago, though I never thought of soliciting their *permission* to make reports of them in the dental journals, as I did not consider that "this sort of work" would be regarded with surprise by *first-class dentists.*

SACRAMENTO, CALIFORNIA, Feb. 13, 1864.

PROCEEDINGS OF DENTAL SOCIETIES.

PROCEEDINGS OF THE ODONTOGRAPHIC SOCIETY OF PENNSYLVANIA.

REPORTED FOR THE DENTAL COSMOS BY G. W. ELLIS, M.D.

THE Society met on Tuesday evening, March 1st, 1864, at eight o'clock, in the rooms of the Philadelphia Dental College.

Vice-President, Dr. Kingsbury, in the Chair.

The following was presented by the Corresponding Secretary, Dr. McQuillen:—

A letter from Robert T. Hulme, Esq., of England, acknowledging the pleasure with which he accepted a corresponding membership with the Society. Accompanying this were two works presented by the same gentleman to the library. Their titles are: "*Contributions to Dental Pathology*, by R. T. Hulme, M.R.C.S., F.L.S." "*Elements of Medical Zoology*, Translated from the French of A. Moquin-Tandon, by R. T. Hulme, M.R.C.S., F.L.S."

A letter from the Hon. R. L. McClellan, D.D.S., donating to the library a copy of the *Legislative Record*, of the State of Pennsylvania,

for 1863. In presenting this work, the Corresponding Secretary took occasion to say that it contained interesting facts with regard to dental education, which the future historian of the profession might look to with some interest, on account of the record there presented of obstacles placed in the way of progressive effort.

A letter from Dr. W. W. Allport, donating to the library the first volume of the "*People's Dental Journal.*"

On motion, a vote of thanks was tendered to these gentlemen, for the liberality and interest manifested by them toward the Society.

It was also announced that the *Scientific American for* 1864 had been subscribed for.

The Executive Committee desires to express the peculiar pleasure afforded it in presenting the name of Dr. Samuel S. White, as a candidate for Honorary membership.

The high-toned justice manifested in his business relations with the members of our specialty; the eagerness to embrace every opportunity for aiding in the elevation of our professional standard; the liberality which has characterized his connection with dental literature as publisher of a journal truly cosmopolitan, and sincerely devoted to the best interests of dentistry, render it a pleasant duty on the part of your committee to request from the Odontographic Society of Pennsylvania that official recognition of merit which they feel is truly deserved.

Dr. J. L. Suesserott, of Chambersburg, Pa., moved that the report of the committee be accepted, its request granted, its publication ordered, and a copy transmitted to Dr. White, by the Corresponding Secretary.

Dr. White thanked the Executive Committee and the Society for the kind expressions contained in the resolutions which they had passed. The complimentary manner in which they had been pleased to recognize his efforts to advance the science and art of dentistry, was especially gratifying. With respect to the literature of the profession, he could only regret that the DENTAL COSMOS had not attained to the excellence in all its departments, that had been hoped for, but he expected, with the earnest co-operation of the members of the profession, to make it much more valuable, and to extend its sphere of usefulness.

The following address was then delivered on the

"ANATOMY AND PHYSIOLOGY OF EXPRESSION."

BY J. H. M'QUILLEN, D.D.S.,

PROFESSOR OF ANATOMY, PHYSIOLOGY, AND HYGIENE IN THE PHILADELPHIA DENTAL COLLEGE.

Gentlemen:—As the essayist of the evening, having no paper ready to present, my remarks of necessity will be of an oral character. The subject I have selected for your consideration is one which should, and more or less actually does, interest everybody; for although on the part of the many there may not be a recognition of the fact, every one is somewhat of a physiognomist; or, in other words, intu-

itively seeks within the few square inches of the "human face divine," to discover the mental and social qualities and past experiences of those with whom he is brought in contact, by the relations of business or pleasure. And there the indelible record is made of the mental training, the high and ennobling, or the low and degrading association, and the joys and sorrows each individual being has experienced. Erroneous estimates may be, and frequently are made by the most acute observer, but this is no evidence that the most legible and unmistakable record was not presented in each instance. An opinion of any value is not to be formed by carelessly and indifferently observing the features when in *repose*, or *noting a few changing expressions;* but by a careful and philosophical examination under *all their varying* and *chamelion-like* forms. A false estimate of character may sometimes be due to the fact that the opportunities and circumstances attending the examination have not been of such a nature as to disclose all the face was capable of revealing; for as a *single word* often gives a clear insight of the life and animus of an individual, so a *single look*, indicative of love or hate, hope or despair, will reveal traits of character which the individual fully recognizes the possession of, and studiously endeavors to conceal from the observation of the world.

Aside from this general interest shared by all in the human face, it is important that those engaged in certain departments of life should become thoroughly acquainted with the mechanism, so to speak, by which the record is made. To the speaker, whether in the pulpit, at the bar, or on the stage, *gesture* is all-important; to the artist, whether as a painter or sculptor, *expression* is everything; and last, though not least, to the dentist a faithful discharge of duty demands that he should, in the performance of his operations on the teeth, invariably endeavor to *preserve* the natural expression of the face, or when the ravages of decay have eventuated in the loss of the dental organs, that the lost expression should be *restored* by the introduction of properly constructed and adapted artificial substitutes. To each and all of these, and particularly to the latter, if they desire to attain the highest possible point of excellence, an intimate acquaintance with the ANATOMY AND PHYSIOLOGY OF EXPRESSION is indispensable. In the brief space allotted to me this evening, little more can be done than to offer, in a general manner, the groundwork on which such an interesting and extended study rests. It would require many evenings, and fill a large sized volume, to do full justice to the theme. With this understanding, permit me in the first place to direct your attention to the main characteristics of the bony framework on which the features rest, for in the language of Tennyson,—

> "Every face, however full,
> Padded round with flesh and fat,
> Is but modeled on a skull."

The roundness and fullness of some faces, the sharp and pinched appearance, or the long and heavy expression of others, is mainly due to the shape and size of the bones on which the features are moulded. In illustration of this, you see on the table a number of craniæ, ranging from the earliest period of infancy to childhood, adolescence, manhood, and extreme old age; and in addition, others belonging to different races, each and all indicating, in a marked degree, the characteristic differences just referred to. In this, for instance, the skull of an infant a month or so after birth, all that portion which contained the brain is relatively large, with a full forehead, but rather flat at the eyebrows, while the bones of the face are diminutive, and their external surface smooth and rounded; no great prominences and depressions, with the exception of the orbital cavities, are presented, and everything contributes to give the plump and meaningless expression characteristic of an infantile face while in repose. Passing to another skull belonging to a child æt. six, the bones of the face are found largely increased in size, and this, along with the presence of the deciduous teeth, serves to lengthen the face, and make it less round than that of the infant. The gradual but marked increase of size in the superior maxillæ presented in these skulls, as we pass from infancy to childhood, from childhood to adolescence, and from adolescence to manhood, is accompanied by a proportionate enlargement of the Antrum Highmorianum; at the same time, as the centre bones of the face, their growth has the effect of increasing the length and prominence of the nasal and malar, or cheek bones. The presence of the large permanent teeth of the adult, and the alveolar processes which support and fix them, serve also to increase the length, breadth, and depth of the superior and inferior maxillæ; and the entire face consequently becomes larger and longer, but not necessarily fuller. In the great majority of cases, indeed, along with the increased size and lengthened visage, there is a decided and proportionate loss of the roundness and fullness presented in the infantile period. The reason for this is obvious, when observing the great prominence of the nasal and malar bones, and the corresponding depressions in the other parts of the face, particularly the canine fossæ of the superior maxilla. In life, when these depressions are not well "padded round with fat," the cheeks of course present a wan and sunken appearance. In the series here presented, while the bones of the face have gradually increased in size, those of the cranium have maintained a proportionate relation. This prominent ridge in particular, (the supra-orbital,) in the frontal bone of this very fine and perfect adult skull, and which has much to do with expression, is owing to the gradual separation of the external and internal plates of the os frontis at this point, so as to form the frontal sinus. On this ridge the eyebrows rest, although they are usually described as resting on the superciliary ridge; but this is not correct.

It is generally conceded that the proportionate relation of the bones of the face to those of the cranium has much to do with the moral and mental qualities of the individual; in other words, that a high order of intellect is usually manifested by those in whom the cranium is large, the forehead broad and high, and the bones of the face small; while the animal propensities are generally evinced in a marked degree, and preponderate over the intellectual in those with depressed foreheads, compressed temples, and large and massive jaws, as in the case of this eminently prognathian skull of an African, with whose antecedents I was made acquainted by the gentleman who presented the specimen to me. The record in his case is in full confirmation of the position just advanced.

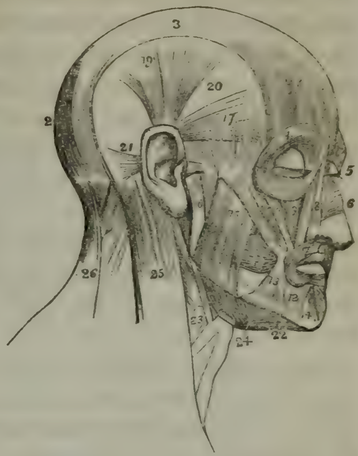
The opposite extreme is sometimes presented, in which the bones of the face are so disproportionately small, in comparison with the cranium, as to constitute a marked deformity. Again, a want of harmony between the different bones of the face is occasionally presented; as for instance, when the inferior maxilla is very large and massive, or unusually small, in comparison with the superior maxilla, or vice versa. This hypertrophied or atrophied condition may occur in any of the bones, and of course when existing will mar the harmony of the surrounding parts.

In extreme old age, the atrophied condition of the jaws (markedly manifest in this skull, belonging to a very old person) due to the gradual loss of all the teeth, and the absorption of the alveolar processes, produces that decided alteration in the features of the aged with which we are all so familiar. The change which invariably takes place in the angle of the lower jaw in consequence of the disappearance of the teeth and processes, causes the chin to project, and when the jaws are closed the nose and chin approximate each other. Even when apart, the falling in of the lips so encroaches upon the oral cavity as to make it too small for the tongue, and thus renders the speech feeble and indistinct It is here where the skill of the mechanical dentist finds a field for artistic labor, not only by replacing the lost expression of the face, but also by restoring the medium through which the wants and thoughts of the individual are made known to others.

Arising from various parts of the bony framework, and then mainly converging to one or the other of the two great centres of expression, the eyes and mouth, there are a number of muscles on whose action the varying play of the features depends. Intending by no means to give, at this time, a lengthy and detailed description of these muscles, but rather to notice them casually, with the aid of the drawings, and the large papier-mache manikin here presented, I hope to make myself clearly understood. We will commence with

The *Occipito frontalis* (1, 2, 3,) consists of two broad but fleshy bellies, with an intervening aponeurosis resting upon the arch of the skull, and over which it slides; the posterior portion of the muscle

arises from the superior curved line of the occipital bone. The prinpal parts of the anterior fibres are inserted, or blend with the corrugator supercilii, and the superior margin of the orbicularis palpebrarum. The minor portions of the right and left frontal muscles unite together some space above the root of the nose, and are inserted at this point and send down fibres which are continuous with the pyramidalis nasæ. *Function.* It moves the scalp, elevates the eyebrows, and induces the transverse wrinkles of the forehead.



The *Corrugator Supercilii* lies under the occipito frontalis, and is a small, pyramidal muscle, arising from the inner extremity of the superciliary ridge; its fibres proceed outward from their origin and blend with those of occipito frontalis and orbicularis palpebrarum. *Function.* It draws the eyebrows and eyelids inward, and produces the vertical wrinkles of the forehead.

The *Orbicularis Palpebrarum* (4) consists of a thin, flat plane of elliptical fibres, which extend around the whole circumference of the orbit and eyelids. It spreads outward on the temple and downward on the cheek, but the only fixed points of attachment, however, to bone are at the inner margin of the orbit. *Function.* It closes the eyelids.

The *Pyramidalis Nasi* (5) is usually regarded as a prolonged slip of the occipito frontalis, which continues downward on the bridge of the nose where it blends with the compressor nasi. *Function.* It draws down the inner angle of the eyebrows, and produces the transverse wrinkles on the bridge of the nôse.

The *Levator Labii Superioris Alæque Nasi* (8) is a thin, triangular muscle, arising from the upper part of the nasal process of the superior maxilla by a pointed extremity, and, as it descends along the side of the nose, gradually increases in breadth, and then divides into two slips, one of which is inserted into the ala of the nose, and the other blends with the orbicularis oris. *Function.* It elevates the upper lip and ala of the nose, and dilates to a considerable extent the latter organ.

The *Compressor Nasi* (6) arises narrow and fleshy from the canine fossæ of the superior maxilla, and its fibres continuing upward and inward expand into a thin aponeurosis which unites on the dorsum of the nose with that of the muscle of the opposite side. *Function.* The compressors may act either as dilators or as constrictors of the nares.

Depressor Labii Superioris Alæque Nasi, covered by the orbicularis oris, arises from the myrtiform fossæ of the superior maxilla, as a short radiating muscle, whose fibres diverge upward and outward; the ascending fibres terminate in the septum and back part of the ala of the nose; the others curve forward and blend with the upper portion of the orbicularis oris. *Function.* It draws the upper lip and ala of the nose downward, and thereby constricts the anterior nares.

The *Levator Labii Superioris Proprius* (9) arises from the lower margin of the orbit, where it is attached partly to the superior maxilla, and partly to the malar bone; its fibres pass downward and inward, and blend with the upper part of the orbicularis oris. *Function.* It is the proper elevator of the upper lip, and at the same time carries it a little inward.

The *Levator Anguli Oris*, covered by the preceding and the zygomatici muscles, arises from the canine fossæ just below the infra-orbital foramen, and its fibres pass downward and outward to be inserted into the orbicularis oris at the angle of the mouth. *Function.* It raises the angle of the mouth and draws it inward.

The *Zygomaticus, Major and Minor*, (10, 11,) arise, the latter in front of the former, from the malar bone, and then pass downward and outward to the upper lip and angle of the mouth, where their fibres blend with the orbicularis oris. *Function.* They raise the upper lip and draw the corners of the mouth outward, as in laughing.

The *Levator Labii Inferioris* (14) arises from the incisive fossæ of the lower jaw external to the symphysis; the fibres pass downward and a little forward to be inserted into the chin. *Function.* It raises and protrudes the lower lip.

The *Depressor Labii Inferioris* (12) arises from the oblique line of the inferior maxilla, just in front of the anterior mental foramen; it is a quadrilateral shaped muscle, and its fibres pass upward and outward to be inserted into the lower lip. *Function.* It draws the lower lip downward and a little outward.

The *Depressor Anguli Oris* (13) arises from the external oblique line of the lower jaw by a broad base, and its fibres converge as they pass upward to be inserted into the angle of the mouth, where they unite with the orbicularis oris, the zygomaticus major, and the levator anguli oris. *Function.* It draws the corners of the mouth downward, and is the antagonist of the muscles just named; when they all act together, the mouth is drawn backward.

The *Buccinator* (18) is a broad, thin muscle, arising from the outer border of the pterygo-maxillary ligament, and the external surface of the alveolar processes of the upper and lower jaw, commencing at the first molar tooth and passing backward. The fibres of the muscles converge, and are inserted into the angle of the mouth and the upper and lower lips.

Function. It compresses the cheek, so as to assist mainly in driving air from the oral cavity, as in blowing on wind instruments.

The *Orbicularis Oris* (7) is a great sphincter muscle surrounding the mouth, and although it has no bony origin or insertion, as we have found, a large number of muscles arising from the different bones of the face centre here and blend their fibres with those of this muscle. *Function.* It closes the lips.

(To be continued.)

Dr. Atkinson, of N. Y., said that he fully appreciated the detail just given, to which he had listened with interest, and which had generated a peculiar train of thought, which he was incapable of imparting. He dwelt at considerable length upon the varieties of expression, and believed it due to a disturbance of tension. The standing of the hair, a phenomenon attendant upon the emotion of fear, he believed to be somewhat analogous to a surcharge of electricity. The predominance of any passion he regarded as an increase of polarity in one tissue, and its diminution in another.

Dr. Suesserott said that the expression of pain would frequently afford an index for the detection of the source of disease. He questioned the influence of electricity in causing the "hair to stand on end," and remarked, that were it due to such a cause, the hand of another placed upon the head would effect a discharge of the superabundant fluid, and thereby allow the hair to resume its natural position; a result which he believed would not follow, thus indicating its origin from some different source.

Dr. Atkinson remarked that the hand *would* act as a conductor, and instanced the fact that it is instinctively extended toward the head of a petulant child. He said that, although bone is considered the most differentiated structure, the hair and enamel are more so, and nerve aura is least so.

Dr. Fitch, of N. Y., said that there was no more pleasant or profitable subject of study than the human face, and as dentists, we should be conversant with the anatomy and physiology of all the muscles concerned in expression, as well as that of the teeth. He remarked that there are certain teeth whose retention is a matter of the utmost importance, for by their peculiar location and form, they contribute in a much greater degree than some of the others toward the preservation of the natural facial contour; and as such, he would mention the cuspidati, whose loss affects not only the lip, but from their prominence also alters the shape of the alæ of the nose. The fangs of teeth he regarded as all-important in preserving the length and fullness of the alveolar border; a fact, however, which their promiscuous removal would induce us to believe was frequently lost sight of. He advocated the treatment and filling of every

root, the preservation of which is deemed practicable; and when their removal is inevitable, he would use means to fill up the sockets with osseous structure, rather than suffer their borders to be removed by absorption. In the introduction of artificial dentures he would aim to simulate nature, and not fall into the too common error of laboring for a *beautiful* result.

Dr. Flagg said that he felt the interest and importance of the subject, in both its theoretical and practical bearings upon dentistry, and yet, as the evening had passed away, he had been less and less inclined to speak, preferring rather to listen to the brothers who were so kindly with us at this time; but the direction which had been spoken to by Dr. Fitch was one in which his heart joined so cordially, that it seemed to him right that he should add his testimony of conviction as to the soundness of doctrine enunciated, and the tangible benefits accruing from the course of practice pointed out by the gentleman. He had almost as often lamented the wholesale extraction of roots as of teeth, but as it was already becoming a test of ability that the dentist should be able to make comfortable and useful anything in the category of *teeth*, he trusted that the proper valne would, ere long, be placed upon that portion of the teeth which alone had the power of maintaining the original contour of the face and oral cavity. He spoke of the importance of retaining roots, by proper treatment and filling, for the furtherance of several ends: perfect maintenance of expression; preservation of normal articulation in speech; *power* of mastication by artificial dentures; prevention of "settling" on the part of these substitutes; and various other advantages, which, by the practitioner of the present day, should be regarded as arguments of weight against the too prevalent method of "properly preparing" mouths for "JOBS!" by taking away that basis of expression which it was impossible for us to completely restore, notwithstanding the marvels which the plasticity of continuous gum material and vulcanizable rubber enabled the dental *artist* to accomplish.

Dr. Butler, of Cleveland, Ohio, regarded the study of the human features as pleasing and profitable, and was happy when enabled to remedy any defect of expression. He said that the admiration awakened by the clear, babbling, dancing brook, would far exceed that occasioned by the stagnant pool; but once remove the pebbles from its bed, the dancing and the babbling cease forever, unless a knowledge of their previous position would enable us to restore them to the places assigned them by nature. He said that dental artistic skill should be cultivated, and constitute not grinning, but laughing and talking faces.

Dr. Mills, of Brooklyn, was highly pleased with the remarks of Dr. McQuillen, and fully appreciated the value which must accrue from the study of expression. Like some of the others, he had taken pleasure in scanning the human features, and believed it the only way to obtain correct data for the construction of artificial work. He expressed his

interest in the promotion of associated effort; and desired to acknowledge the kindness and courtesy which he had received at the hands of his Philadelphia brethren.

Dr. Ellis said that the subject, in all its bearings, had been pretty thoroughly considered; yet he felt inclined to add his mite of testimony in favor of the practice just mentioned, and advocated by Dr. Fitch, of retaining all roots, unless from some pathological condition their extraction be indicated. He thought, with that gentleman, the practice of promiscuously removing roots could not be too strongly deprecated; for, in addition to the pain unnecessarily inflicted, every root lost is an injury, which the skill of the artistic workman may cunningly conceal, yet, though closely counterfeited, nature is perfect in many particulars which it is impossible to more than imperfectly imitate.

Dr. Fitch said that he adopted the following motto: "Never consent to remove a tooth that can be saved."

Adjourned.

PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

The annual commencement of the Pennsylvania College of Dental Surgery was held at the Musical Fund Hall, Philadelphia, February 26th, 1864.

The valedictory was delivered by G. T. Barker, D.D.S., Professor of Principles of Dental Surgery and Therapeutics.

The number of matriculants for the session was forty-five.

The degree of D.D.S. was conferred on the following gentlemen, by Washington L. Atlee, M.D.:—

Name.	Residence.	Title of Thesis.
R. H. Shoemaker,	Pennsylvania,	Alveolar Abscess.
Alex. O'Callaghan,	Cuba,	Dental Caries and its Treatment.
Geo. J. Underwood,	New York,	Orthodontia.
Edwin C. Baxter,	Maine,	Dental Periostitis.
Abram S. Reber,	Pennsylvania,	The Relations of the Teeth to each, and the Importance of these Relations.
Henry Cowie,	Michigan,	Diseased Pulps and their Treatment.
Frederico Comas,	Cuba,	Mechanical Dentistry.
Manuel Trujillo,	Cuba,	Caries.
W. T. Shannon,	New Jersey,	Exposed Pulps.
J. G. Camp,	Pennsylvania,	Neuralgia.
J. W. Vanosten,	Pennsylvania,	Dental Caries.
G. W. Caldwell,	Pennsylvania,	The Arsenical Paste.
S. C. Richardson,	Illinois,	Why Superior Teeth decay in greater Proportion than Inferior.
J. B. Snow,	Connecticut,	Cheap Mechanical Dentistry.
George Clark,	Vermont,	Dental Caries.
Edward Lefaivre,	Canada,	Dentistry in Canada.
Thos. E. Osmun, M.D.,	Pennsylvania,	Inflammation.

The following are the reports of the Demonstrators:—

OPERATIVE DEPARTMENT.

Number of Patients visiting the Clinic	2202
Number for whom the following operations were performed	1687
Gold Fillings	607
Tin "	690
Temporary Fillings	13
Amalgam "	6
Treatment and Filling Pulp Cavities	201
Superficial Caries removed	15
Removal of Salivary Calculi	85
Treatment of Periostitis	37
" Alveolar Abscess	24
" Inflammation of the Gums	5
" Partial Necrosis	15
" Diseased Antrum	2
" Irregularities	15
" Necrosis of Superior Maxilla	1
Extraction of Teeth and Roots	2112
Total	3828

JAMES TRUMAN, *Demonstrator.*

MECHANICAL DEPARTMENT.

125 *Patients were supplied with the following artificial dentures:—*

Whole Sets of Teeth	21
Full Upper Sets	42
Full Lower Sets	3
Full Upper Set, Blocks	1
" Continuous Gum Sets	3
Partial Upper Sets	60
" Lower Sets	8
Obturators*	3
Teeth Mounted on Metal Plates	517
" Hard Rubber Base	1130
Whole Number of Gum Teeth	671
" Plain Teeth	976
" Teeth Mounted	1647

EDWARD N. BAILEY, A.M., *Demonstrator.*

PHILADELPHIA DENTAL COLLEGE.

The first annual commencement of the Philadelphia Dental College was held at Concert Hall, Philadelphia, February 29th, 1864.

The valedictory was delivered by C. A. Kingsbury, D.D.S., Professor of Dental Physiology and Operative Dentistry.

The number of matriculants for the session was eleven.

The degree of D.D.S. was conferred on the following gentlemen, by Rev. Richard Newton, D.D.:—

* These were made for soldiers who lost their teeth and adjacent bones from gunshot wounds received in the mouth.

Name.	Residence.	Title of Thesis.
Wm. A. Breen,	Pennsylvania,	Dental Caries.
Wm. P. Henry,	Pennsylvania,	Mechanical Dentistry.
Richard J. Hoffner,	Pennsylvania,	Saliva.
Henry E. Knox,	Massachusetts,	Dental Caries.
Wm. S. Miller,	Massachusetts,	Vulcanite.
Ambler Tees,	Pennsylvania,	Nitrous Oxide.

The following are the reports of the Demonstrators:—

OPERATIVE DEPARTMENT.

Gold Fillings	140
Tin "	249
Amalgam Fillings	31
Wood's Metal	5
Oxy-Chloride of Zinc	2
Pulp Cavities treated and filled	62
Treatment of Periodontitis	18
" Alveolar Abscess	23
Salivary Calculi removed	45
Teeth Extracted	175
Roots Extracted	305
Irregularities Corrected	7
Pivot Teeth Inserted	3
Disease of the Antrum treated	1
Operations, total	1066

GEO. W. ELLIS, *Demonstrator.*

MECHANICAL DEPARTMENT.

80 *Patients for whom the following operations were performed:—*

Whole Sets of Teeth	15
Full, Upper	10
Full, Lower	2
Continuous Gum	1
Partial, Upper, Gold	1
Partial, Upper, Silver	29
Partial, Lower, Silver	1
Whole Sets, on Vulcanite Base	13
Full, Upper, " "	10
Partial, Upper, " "	5
Teeth Manufactured, Single Gum	48
Teeth Manufactured, Plain	12
Teeth Manufactured, Upper Set, Carved Blocks	1
Whole Number of Teeth Mounted	898

* WM. GORGES, *Demonstrator.*

BROOKLYN DENTAL ASSOCIATION.

BY THOS. BURGH, D.D.S.

A meeting of the Association was held January 20th, 1864, Dr. Parks in the Chair. Subject continued from previous meeting.

Dr. J. Allen said the best way to manage sensitive dentine is to encourage the patient to bear the suffering, by saying the worst will soon be over, and to use sharp excavators. With this method he is generally

successful. Sometimes makes application of a weak mixture of arsenic and creosote, but is fearful of it. Burnishes the cavity before filling.

Dr. Perine never resorted to medicines, preferring the quick use of sharp instruments. Considered it important to obtain the confidence of the patient. Thinks we are sometimes not in a frame of mind to prepare the patient for an operation, and should then defer to another time.

Dr. Marvine agreed exactly with what had been said by the previous speakers. Referred to the fact that many cavities are sensitive on the first application of an instrument, but the sensitiveness subsides after a few strokes. Occasionally uses creosote and arsenic, and never found any trouble from their use. Finds deep cavities not sensitive. The rapid motion of a sharp instrument generally accomplishes all he wants.

Dr. Kingsley did not share the confidence of some in sharp excavators. Had almost sacrificed two of his own teeth in experiments to remedy their sensitiveness. Would not submit to *vigorous cutting* upon them; and does to his patients as he would be done by. It would not do to say it would be all over in a few minutes, for it was not. Uses a combination of arsenic, morphia, and creosote. Had used it in his own teeth. Would lose them rather than have them excavated without the sensitiveness being obtunded. Had used other remedies, but they left the teeth as sensitive as ever. In view of this experience, he thanked God for arsenic. Had never destroyed a pulp by this use of it, to his knowledge; yet feels, in every case, as though he would rather not use it. When it is possible that the decay is near the nerve, he exposes it, and then destroys it. Allowed two of his own teeth to decay to the nerve before he would have them excavated. Almost the smallest amount of arsenic that can be used is sufficient. Condemned the popular bungling use of it.

Dr. A. C. Hawes is not quite satisfied that it is safe to use arsenic for this purpose. According to the argument, there is no danger of its penetrating the tooth, yet it will extend all over the cavity.

Dr. Kingsley—Creosote carries the arsenic all over the cavity, and there is not enough left in any one place to penetrate to any depth. He frequently, when making appointments for an afternoon, directs the patient to call in the morning, to have an application to the cavities to be filled.

Dr. W. H. Allen has used arsenic, combined with acetate of morphia, to obtund sensitive dentine, for fifteen years, and with good success. Thinks there is no danger to be apprehended from it, if used carefully. Does not think he has ever, by its use, caused the death of a pulp which was not exposed.

Dr. W. H. Allen said that Dr. John Lovejoy suggested the use of aconite to him, for this purpose, three or four years ago. Tried it; and thinks he obtained some good effect from it, but so little that he soon abandoned it.

Dr. Fitch regarded the causes of sensitive dentine as chemico-vital. Neither one of these causes, acting separately, would satisfactorily account for this pathological condition. Generally found that persons who experience much suffering from this dental lesion are in an irritable physical condition; an alkalinity of the blood is, many times, manifestly present. Under these circumstances he would exhibit an internal acid treatment. By this class of medication oxidation of the blood is secured, and its plasticity restored, thereby correcting this alkaline diathesis. Instanced a case of this kind, where an acid tonic treatment was had recourse to. In the course of two or three weeks this condition of sensitive dentine had entirely disappeared. An irritable physical condition is generally present whenever the dentine is extremely sensitive. It is unquestionably a lesion in nutrition. Regarded this condition as the principal cause. Local chemical action, which may, and often does attend this general physical condition, is frequently much more active; and tooth substance disappears more rapidly from chemical action in such cases than if unattended with systemic disturbances. Local treatment in such cases is necessary. Thought that arsenious acid, when applied to sensitive dentine, acted upon the peripheral contents of the tubuli, forming an arseniate of albumen, thereby cutting off the transmission of contact with the dentinal substance to the pulp. Doubted the destructive influence of arsenic upon the pulp through the dentine. The action of arsenic upon the pulp, when brought in direct contact with it, destroys as an irritant, producing congestion. As a general thing, thought that too large a quantity was employed for this purpose. Often had met with instances where several repeated applications were necessary to devitalize the pulp. It was no doubt due to the fact that so much of the arsenic was present as to immediately form a coating of the arseniate of albumen upon the surface of the pulp, thereby suspending the irritating action of the arsenic. Would recommend the use of very small quantities—say from $\frac{1}{100}$ to $\frac{1}{1000}$ of a grain—leaving it in the tooth several days. Chloride of zinc, applied to dentine, acts more rapidly than arsenic; also is attended with more pain; should be used with great caution. Believes that the surface of the dentine, reduced as it is by the act of decomposition to a semi-fluid condition, simulates nerve structure and takes on nervous function. The subsidence of pain in such instances, after two or three cuts of the instrument, seems to point to this conclusion. There is undoubtedly a combination of causes, mediate and immediate, connected with this phase of dental pathology.

Dr. Fitch had employed the extract of aconite (Rad.) for phlegmonous inflammation, neuralgia, etc. in the form of an ointment; also the tincture of aconite, used externally, with the happiest results. But cautioned against the use of it, on account of its powerful anæsthetic effects. It is classed among the most potent sedative poisons. Has employed conge-

lation with similar results. Remembers having frozen, some years since, the surface of the back, in the lumbar region, of a gentleman who was suffering from lumbago. Relief was experienced in a few moments. Was particular in this case, as he should be in any where congelation is employed, to restore the parts to normal temperature very gradually, as otherwise much harm may be done. Instanced a case of a lady who, being recommended by her dentist to try the aconite ointment for neuralgia, experienced the unhappy results of paralyzing the entire side of her face and head, which remained in this condition two or three days. An aconite ointment for this purpose should not contain more than four grains of the alcoholic extract of the root to one ounce of cerate. The tincture of the leaves (tinct. aconiti foliorum) may be applied to an external surface more freely; yet this should be used with care.

CHICAGO DENTAL SOCIETY.

"At a meeting of the Chicago Dental Society on Monday evening, March 14th, some of the members desiring to have the proceedings of the previous meeting published, Dr. Cushing offered the following, which was adopted:—

"*Resolved*, That the Secretary be requested to furnish the daily papers of this city, the Dental Cosmos, and the *Dental Register of the West*, a condensed report of the proceedings of the Society at its last meeting, so far as relates to its organization and the election of officers.

"In accordance with the resolution, the following report is presented:—

"On Monday evening, February 8th, the following named gentlemen of this city met at S. S. White's Dental Depot, for the purpose of forming a Dental Society: Drs. E. W. Hadley, James C. Dean, John C. Fuller, Wm. Albaugh, W. W. Allport, J. H. Young, G. H. Cushing, L. R. Haskell, S. B. Noble, E. W. Sawyer, L. Bush, and J. Ward Ellis. Dr. E. W. Hadley, the oldest resident dentist of the city, was elected temporary chairman, and E. W. Sawyer, temporary secretary; and the Chicago Dental Society was organized by adopting a constitution and by-laws, and electing the following officers:—

"*President.*—Dr. E. W. Hadley.

"*Vice-Presidents.*—Dr. J. H. Young, Dr. L. Bush.

"*Recording and Corresponding Secretary.*—Dr. E. W. Sawyer.

"*Treasurer.*—Dr. J. C. Dean.

"*Executive Committee.*—Dr. L. P. Haskell, Dr. S. B. Noble, Dr. Wm. Albaugh.

"*Librarian.*—Dr. W. W. Allport.

"Dr. S. S. White, of Philadelphia, and S. R. Bingham, of this city, were elected Honorary members.

"At a meeting of the Chicago Dental Society, Monday evening, March 14th, the following gentlemen of this city were elected Active members of the Society: Drs. A. W. Freeman, B. M. Baker, A. J. Harris, F. A. Bogue, T. P. Abell, E. R. E. Carpenter, J. A. Kennicott, H. Hall, T. Fay, J. Deschaur, J. W. Smith, and W. A. Stevens. And the following Honorary members, proposed by Dr. Allport, were elected: Drs. J. H. McQuillen, of Philadelphia, Pa.; C. N. Peirce, of Philadelphia, Pa.; J. Taft, of Cincinnati, O.; J. Taylor, of Cincinnati, O.; G. Watt, Xenia, O.; W. H. Allen, of New York City; N. W. Kingsley, of New York City; H. I. McKellops, St. Louis, Mo.; C. W. Spalding, St. Louis, Mo.; H. E. Peebles, St. Louis, Mo.; D. W. Perkins, of Milwaukee, Wis.; J. Richardson, Terre Haute, Ind.; A. Hill, Norwalk, Conn.; S. S. Nones, Wilmington, Del.; and E. F. Wilson, of Chicago.

"Dr. Hadley delivered an excellent address, showing the benefit and power of combined effort, and the exercise of Christian principles; 'and the greatest of these is charity.' He spoke of the difficulties that were encountered by the profession twenty years ago, and his own efforts to overcome them; and closed with the wish, and the hope, that this Society, so happily begun, may continue '*not for a day, but for all time.*' After Dr. Hadley's address, Dr. Allport read a paper before the Society, which ought to be read by every one in the community, showing the absolute necessity of keeping the teeth clean, in order to prevent their becoming diseased, and gave it as his opinion, that three-fourths of the teeth now injured by disease could have been kept healthy by proper care in this respect on the part of the patient. He endeavored to impress upon our minds that it is the duty of the true dentist not only to perform all operations faithfully, but to endeavor to instruct the people how to avoid the cause.

"The Society voted that a copy of Dr. Hadley's address, and the paper read by Dr. Allport, be furnished the *People's Dental Journal*, the DENTAL COSMOS, and the *Dental Register of the West.*

"Adjourned to the second Monday in April."

EDITORIAL.

"B. WOOD'S IMPROVED PLASTIC METALLIC FILLING."

WE have always been willing to do everything in our power to further the best interests of the dental profession, to the best of our judgment. Wherever we fail to accomplish our intention to the fullest extent, in the opinion of others, it must be set down to error of judgment, and not to a studied purpose to do differently. We have been written to by several dentists, to know what we thought of Wood's plastic filling. We have

not answered any of those letters, simply because we have not the time to write, on the different topics connected with the profession, for the journal and private correspondents too; but the following letter we feel bound to answer, because it contains a moral as well as a practical meaning:—

"ALBANY, Aug. 12, 1863.

"*Doct. J. D. White.*

"DEAR SIR:—I send herewith a sample of my improved Plastic Metallic Filling, and insist on your giving it a *trial.* I KNOW it is a good thing and a great blessing to humanity. You have great influence. You can retard the use of a good thing, (and thereby impair that influence,) or you can extend its benefits. If you are afraid of the heat, use it at first over oxy-chlo. of zinc fillings, and you will find that you have what has long been wanted.

"Yours, respectfully, B. WOOD."

Now, we had tried the plastic filling before receiving the above letter, but did not intend to say anything about it, unless it came up in a way that made it necessary. There are a great many things done, and practices followed in dentistry, about which we have nothing to say; nor do we think it is our business, as long as the dentists, and the patients they operate for, are satisfied. This remark we have made long ago; and besides, there is a principle involved in it, which we hope to get the credit for; that is, we do not wish to write every one into our views. We hold that while in some things men in a profession are all bound to agree, there are others on which there is room for a wide difference of opinion, and a difference, too, without incurring the disrespect of each other. We do not find any use for plastic filling in our practice, because we do not use anything for plugging teeth but gold, Hill's stopping, oxy-chloride of zinc, and tin. If we required anything else in our practice, we would use the old-fashioned amalgam, or its modification, known as Townsend's; because it is hard enough for all practical purposes, and has not the disadvantages of complicating the manipulations with it by using heat. Metals applied by heat are not of recent date. We have had some experience in that direction, and which we referred to in an article in the *News Letter* some years since, but it will not be out of place to refer to it here. The following letter will explain. It was handed to us without solicitation, as well as some others of a similar import, from eminent medical men:—

"Mr. John D. White operated in my family in the spring of 1838; I can therefore bear testimony as to his practical skill in dentistry, and to his gentlemanly deportment.

"Upon several decayed teeth which I supposed worthless, he used a metallic filling, and now, after a lapse of 18 months, I find them to be

quite as serviceable as the sound teeth adjoining. I am satisfied no other method of plugging would have answered the purposes of mastication, and prevention of decay.

"I can, therefore, recommend his metallic compound in every instance, for filling the cavities of back teeth, where gold, silver, etc. would remain in but for a few days. DR. M. F. GROVES."

We have no doubt but this gentleman was sincere in what he wrote to us. This metallic compound was used by heat, precisely as Dr. Wood's, and looked as much like it as possible. It was no better than the amalgam, except that it contained less mercury. Here is a copy of an advertisement, which was gratuitously published, without our knowledge, by a grateful patient:—

"WHITE'S TERRA METALLIC COMPOUND.—About seven months since the subscriber had a number of his teeth, which were very much decayed, together with several stumps, filled by Mr. J. D. White, No. 35 South Tenth Street, with his Terra Metallic Compound for plugging teeth. It is but an act of justice to that gentleman, and a duty which I owe to the public, to state that the operation proved every way satisfactory, as the teeth were entirely unfit to be filled with foil; and stumps are, I believe, never filled with gold or silver. H. PIERCE."

Now, these gentlemen doubtless felt that to withhold their testimony in relation to the benefits they derived from the use of the "*Terra Metallic Compound!*" would be "retarding the use of a good thing." The letters we received were from men of education and influence; and one of the gentlemen, who is still living in our city, is of the highest integrity and scientific acquirements. B. Horner Coates, M.D., for whom we plugged four teeth, insisted on our going with his note to Prof. Samuel Jackson, of the University of Pennsylvania, to get him to indorse his letter, to help to push forward the good cause and blessing to mankind. But what was our reception by the distinguished professor? He looked to see who was the writer of the letter; and seeing that it was his esteemed friend, Dr. Coates, he smiled, and commenced at the head of the letter to read its contents; but when he became acquainted with them, and the object of the writer in soliciting his name and influence, he indignantly handed it back, remarking, at the same time, in the most emphatic manner, "*it is a prostitution of the name.*" Now, these good gentlemen, and the worthy professor, may have been wrong; but we left the use of the compound, and applied ourselves, more energetically than ever, to the study of the science of medicine, from which we hoped to draw wholesome lessons and knowledge, by which we might become capable of meeting the wants of our patients, and obtain a better understanding of the principles of physiology, pathology, and the patient's physical well-being, than could be obtained from the dental works then extant, or any mechanical trick in the

trade, or secret compound to fill teeth, without regard to the consequences. We do not believe that *metallic compounds*, as such, are any better now placed in a living tooth, or in a dead tooth, in a mouth susceptible to all the vicissitudes of health and disease to which the nervous organization of a patient is exposed, than a quarter of a century ago; therefore, whatever good may follow their use, must be without our "influence." If they are good, and have no evil of consequence connected with them, they will force their way to public favor, in spite of any retarding influences we may exert, and establish themselves as auxiliaries among the many things which go to make up the sum of human happiness in the onward march of time. J. D. W.

REVIEW OF DENTAL LITERATURE AND ART.

BY J. H. M'QUILLEN, D.D.S.,
PROFESSOR OF ANATOMY, PHYSIOLOGY, AND HYGIENE IN THE PHILADELPHIA DENTAL COLLEGE.

CHICAGO DENTAL SOCIETY.—The account of the establishment of a Dental Society in Chicago, which will be found in another part of this journal, it is trusted will stimulate the profession in other cities, where there are no local societies, to be up and doing in the good cause.

A personal acquaintance with some of the active members, and a knowledge of the abilities and attainments of others of them, induces the conviction on my part that this organization will be, in every sense of the word, a *live* society; and that it will exercise a beneficial influence, not only upon the profession and community in its own neighborhood, but will also contribute largely to advance the great interests of the profession throughout the entire country. Every city of any size in the Union should have at least one local society, and be represented at the next meeting of the *American Dental Association*, to be held at Niagara Falls, on the last Tuesday of July, 1864. Boston, Baltimore, Wheeling, and other cities which might be named, have all the elements for the formation of excellent societies; and if the older members of the profession there will not move in the matter, let the younger portion take the initiatory steps; and though they may be limited in numbers, and with little or no reputation or influence, if their hearts are in the cause, and they will *work* earnestly, devotedly, and with a singleness of purpose, success will attend their efforts, and an increased sphere of usefulness will be opened to them. A few months yet remain to effect such organizations, and secure a representation in the national association. Let the proper steps then be taken at once, by all who feel an *interest in*, and a *conviction* of the *usefulness* of, local societies and a national association resting upon a representative basis.

Syracuse Daily Journal.

"*Laughing Gas.*—Not long since several lectures and exhibitions were given at Wieting Hall, by an itinerant lecturer, by the name of Collins, upon this so-called laughing gas.

"During their progress, an article as *editorial*, but evidently prepared by Collins himself, appeared in two of our daily papers—and as this publication, and the lectures to which it alludes, seems to have had a wonderful effect upon this community, I propose as briefly as possible to analyze the merits of this gas as an anæsthetic agent.

"Now, had this speculator in the health and lives of our citizens written this article expressly to show his profound ignorance, not only of the human system, but of every branch of medicine and chemistry, he could not have been more successful; and yet, strange to say, by just such articles as this, backed by a flood of similar *advertisements*, the public are led, nay, constrained, to believe that this gas is not only always efficient in producing the desired effect, but that it is *always harmless*. From an advertisement now before me, a dentist of Bond Street, N. Y., and one who claims to be at the head of a '*Dental Association' bearing his own name*, gives the following *five reasons* why all should use it who wish to become temporarily insensible to pain, viz.:—

"1st. It is perfectly harmless.

"2d. The insensibility is perfect.

"3d. It is pleasant to inhale.

"4th. The whole time occupied in the inhalation and extracting from three to ten teeth, and returning to *perfect* consciousness, does not exceed *three minutes*.

"5th. *It can be given with safety in all sorts and stages of disease!!!*

"Now, what rational person can for one moment swallow such a pill as is here presented—sugar-coated though it be? Who can suppose that any *sound* person, not to say those in the last stages of disease, can be brought into so unnatural a state in '*thirty seconds' perfectly harmlessly?*

"The two important questions as regards the use of this gas for denta purposes are these, viz.:—

"1st. Will it '*always*,' or, indeed, generally, produce the desired effect, or *insensibility to pain?*

"2d. Is it harmless, even in the most judicious hands?

"As regards the former question, I have to confess that I have no experience with it 'for dental purposes,' but having been engaged for six consecutive years, at one period of my life, in practical chemistry, I have administered it from one to two hundred times as a scientific experiment, and I can say that in no instance did I ever see a person under its influence in a fit state to have teeth extracted, or any other surgical operation performed, or even where teeth could be extracted without danger to the *operator*, if not the patient. In these experiments it was given only for its exhilarating effects, and *never* designedly carried (for reasons which we then supposed to be good, and which I shall allude to hereafter) to the point of stupefying the person inhaling it.

"This Mr. Collins asserts, among other things, in his editorial, that 'there is no possible danger of a person doing or saying anything which they might have occasion to regret.' This is by no means my own experience with this gas. I have often witnessed the most pious using the most profane, and the delicate the most obscene, language; and the most

fastidious persons are liable to cut antics, the mention of which would make them blush when rational. But this is by no means the great objection to its use.

"The position which I shall take and endeavor to establish by facts and fair deductions is, that it is always dangerous,—not that it necessarily proves hurtful in all cases, but that it would require superhuman skill to tell whether the subject might or might not have some organic defect or disease. But a very short time since a soldier died suddenly in this city who had just previously been examined by a medical board and pronounced sound and 'able-bodied.' So sudden and mysterious was his death, that the woman with whom he was at the time boarding was arrested and imprisoned for his murder. But a post-mortem examination, however, released this woman from prison and relieved the public of all doubt as to the cause of his death. 'One lung was found to be entirely destroyed by disease, and the other was nearly consumed!' Now if such mistakes as these were liable to be committed by a board of medical men intrusted with the responsible duty of selecting fit and able-bodied men for our army, what will be the chances for similar mistakes by such men as are urging this gas upon the community as 'perfectly harmless,'—not one in ten of which are medically educated, or in any way qualified to make such an examination?

"But before offering any direct testimony upon this point, let us examine for a moment the logic of this Mr. Collins, who seems to have been the oracle and file leader for this region, and who for a number of evenings drew large audiences at Wieting Hall, as a *lecturer* upon the *sciences* of this gas. The general ideas put forth in these lectures are rehearsed in the 'editorial' above referred to. His explanations of its *harmlessness* and *exhilarating qualities* are thus stated by him:—

"'It consists *merely of the elements of the common air—nitrogen and oxygen, mixed in a little different proportions. It has a larger proportion of the life-giving principle—oxygen—than the atmosphere; and hence, when inhaled, makes one live much faster than when he breathes common air!*'

"In his attempted explanation, the writer has shown himself wholly ignorant of the laws of chemical affinity. He has blended a *mixture* with a *chemical combination*, and drawn his conclusions accordingly, than which a more absurd and fatal mistake could not be made in any attempt to reason upon such a subject. It is quite true that oxygen in its pure state would be too stimulating for respiration; and hence, as we find it in the atmosphere, it is *diluted* with nitrogen—a gas wholly inert in its pure state. But it must be borne in mind that these two gases are simply in a state of *mixture*, as composing the common air,—the nature of neither being essentially changed. Take another example: Oxygen and hydrogen, when merely *mixed*, still retain their gaseous forms and elemental properties, and constitute an exceedingly inflammable and explosive mixture; but when these two gases are *chemically* combined, the result is *water*,—a substance wholly antagonistic in all its properties to those of either of its elements. Now, it would be just as rational for one to contend, while drinking water, or breathing its vapor, that he was drinking or breathing oxygen or hydrogen, as to say that he was breathing oxygen, when it was chemically combined with any other substance. The universal law of chemistry is, that whenever any two substances are united by chemical affinity, the properties of both are changed, and the

result is a third substance differing from either, and that the elements in such compounds cannot act in their individual capacity till a positive decomposition is effected. And hence the perfect absurdity of supposing that we are breathing oxygen simply because we may be inhaling something containing oxygen as a chemical constituent. The resulting compound from a union of the most acrid substances is frequently inert. Common plaster of Paris is composed of sulphuric acid and lime; but when these two acrid substances are combined chemically, the result is that perfectly non-corrosive substance known as plaster of Paris.

"These examples might be multiplied *ad infinitum*, but I shall offer but one other, which will not only illustrate remarkable changes wrought by chemical affinity between *different* substances, but where an equally surprising result is obtained *by combining the same substances, simply in 'different proportions,'* and I can offer no better example than is seen in these very gases—oxygen and nitrogen—in the different proportions in which they are capable of being united. Bearing in mind the nature and properties of these two gases, as simple substances, or when they are simply *mixed*, as in the atmosphere, let us see what changes are whought by *chemically* combining them, and in different proportions.

"These two gases are capable of being combined in five different proportions:—

	Proportion.	Result.
1st.	Oxygen 1,	Nitrogen 1—Nitrous Oxide—[Laughing Gas.]
2d.	Oxygen 2,	Nitrogen 1—Nitric Oxide.
3d.	Oxygen 3,	Nitrogen 1—Hypo-nitrous Acid.
4th.	Oxygen 4,	Nitrogen 1—Nitrous Acid.
5th.	Oxygen 5,	Nitrogen 1—Nitric Acid—[Aqua Fortis.]

"It is not necessary to describe the peculiar qualities of all of these compounds. It is sufficient to say that while one proportion of oxygen and one of nitrogen, *chemically combined*, forms the exhilarating or laughing gas, *two* proportions of oxygen, with the same amount of nitrogen, forms the nitric oxide gas, a single inspiration of which would destroy life almost instantly. And *five proportions of oxygen*, with one proportion of nitrogen, constitutes nitric acid, or aqua fortis,—a substance not tolerated by any part of the human system for a single moment.

"But our learned champion for laughing gas gives us to understand that the more oxygen we combine with nitrogen, the more exhilarating and healthful it is. The air, containing but one proportion of the former to three of the latter, he informs us, is not exhilarating; but by placing them on one equal footing in respect to quantity, the result is a most exhilarating and healthful atmosphere! But why stop here? Why, according to his logic, should not nitric acid be *five* times as exhilarating and healthy as nitrous oxide, or laughing gas?

"The upshot of this whole matter is simply this: No man, however good a chemist he may be, can predict the nature of a compound by any study of its elements,—much less its effect upon the human system. This is to be done, and only to be done by actual experiment. The chemist who first discovered that the combination of one equivalent of each of the two gases—oxygen and nitrogen—constitutes the exhilarating gas, was of course entirely familiar with the nature and properties of both of its constituents, and yet he was doubtless not a little surprised to find the resulting compound was of such a character; nor could his surprise have been less when he found that simply by doubling the amount of oxygen,

the resulting compound was of a most deadly character, as regards its effects upon the human system. There are now three substances in use as anæsthetic agents, viz.: sulphuric ether, chloroform, and nitrous oxide,—the chemical composition of each of which is as follows:—

"Nitrous oxide is composed of—nitrogen 1 proportion, oxygen 1 proportion.

"Sulphuric ether—carbon 4 proportions, hydrogen 5 proportions, oxygen 1 proportion.

"Chloroform—carbon 2 proportions, hydrogen 1 proportion, chlorine 3 proportions.

"From the above it will be seen that inasmuch as the effects of each of these upon the human system is essentially the same, no judgment can be based upon their composition as to their nature in this relation. While the nitrous oxide is one-half oxygen, ether contains but one-tenth, and chloroform not one particle of oxygen. The question now naturally arises, what is the effect of the nitrous oxide as shown by actual experiment? I answer in general terms of comparison.

"*It is essentially the same as that produced by chloroform or ether*, with at least two drawbacks against it, which I shall hereafter point out. The first effect of any and of all these agents, is to produce great and rapid excitement throughout the whole system; the blood-vessels are enlarged, and the blood circulates with nearly or quite double its usual rapidity. When this exhilarating stage has reached its height, a stupor gradually supervenes, and the pulse correspondingly lessens, till frequently it becomes frightfully slow and weak. Now, it is very easy to account for this rapid exhilaration. A stimulant taken into the *stomach*, as ardent spirits, has to pass through the ordinary channels of digestion before it reaches the brain, but this, being absorbed by the blood as it passes through the lungs, is taken almost instantly to the brain. But as to how it produces its anæsthetic effects, or entire insensibility to pain, is a question far more difficult of solution. There are two theories upon this point; the one accounts for the phenomenon by supposing that the extraordinary amount of blood carried to the brain produces actual compression upon this organ, and that the effect is the same as if the skull were actually depressed, which always produces insensibility.

"Prof. Simpson, of Edinburgh, who first introduced chloroform into surgical and dental practice, accounts for this result by ascribing it to its peculiar effect upon the nervous system. He contends that those nerves which control motion are first affected by it, those of sensation next, and that it may under peculiar circumstances reach and paralyze the vital nerves, in which case instant death must ensue. But it matters very little which theory we adopt, either in regard to its anæsthetic or fatal effects, as the modus operandi in producing them is essentially the same in each; and, as a legitimate conclusion, it follows that if there is in any given case any good reason why ether or chloroform should not be used, there must be an equally strong one for avoiding the nitrous oxide gas. Neither of them, if pure, is, strictly speaking, poisonous, yet each of them will destroy life. My own view of these articles is this: that *any* agent capable of producing so unnatural a state, in so short a time, must necessarily thoroughly test the soundness of all who have this test applied, and if they have any physical ailments or defects, it will be quite sure to find them. It hardly need be added, that the employment of such agents should be confined to those thoroughly skilled in medical science, and at

that, used with the utmost caution. In regard to the comparative effect of these three substances respectively, my conviction is, that while the nitrous oxide is by far the most exhilarating, its anæsthetic effects are greatly inferior to either of the others.

"In whatever light we may view this 'great and new discovery,' (which, by the way, was made just 92 years ago,) I have yet to see the smallest advantage, in any particular, it has over either chloroform or ether; and there are some objections to its employment as an anæsthetic agent, which do not pertain to either of the other articles. It is well known to almost every school-child that of the air we inhale, nearly eight per cent. is retained in the blood, and that a different and poisonous article, carbonic acid gas, is returned instead, and that oxygen is absolutely necessary to sustain life. Now, in the inhalation of both chloroform and ether, a free supply of air is always taken into the lungs, in connection with the vapor of these substances. But how is it with the inhalation of the nitrous oxide? This is breathed from a rubber bag, (which is of course air tight,) and thus all the carbonic acid exhaled is returned into the bag to be rebreathed. The gas must therefore necessarily soon be so contaminated as to become actually poisonous. Not only so, it is true that from the first oxygen is positively excluded,—for, as I have already demonstrated, oxygen, to be available for supporting life, must be free,—that any amount of it in chemical combination with other substances is not of the least account.

"It therefore follows that, in addition to every objection which can be urged against the use of chloroform or ether, these two must be superadded to nitrous oxide, viz., the patent is compelled to breathe more or less carbonic acid gas after the very first exhalation, and moreover, an atmosphere totally deprived of the life-supporting principle—oxygen.

"At best, no one could live longer, if confined to this gas, than he could live under water, or sustain life without oxygen; and this, as all know, would be but a few minutes. But we are not dependent upon *theory* to exhibit the dangerous effects of this misnamed laughing gas. Facts are coming to us every day, which not merely demonstrate its deleterious, but its *fatal* effects.

"During the period in which I was in the habit of administering it in the chemical laboratory or lecture-room, several serious cases, and one which came near to proving fatal, came under my own observation, and yet in no case did we intend to carry its effects beyond the exhilarating stage.

"The last case above alluded to was that of a young man, apparently in full health, about twenty years of age, and in all respects seemed to be as good a subject as could be presented for a full dose. He had breathed it but a short time before he became entirely insensible, and apparently lifeless, and it was several hours before he could be fully restored to consciousness, and several weeks before he fully recovered from its effects.

"Prof. Amos Eaton, the founder of the Rensselaer Institute, uniformly in his lectures upon this subject gave the strictest caution relative to its use, and related many instances of its deleterious effects, even when prepared and administered by the most skillful and judicious hands.

"In a letter just received from an intelligent dentist of a neighboring city, three cases of its bad effects are related, all occurring within the last two weeks. 'In one of the cases the patient is still in such a state as to render his recovery doubtful.' The lamentable and fatal case of Samuel

P. Sears, who was a most estimable man, of New York City, and who died within a few minutes after inhaling it, is fresh in the minds of us all.

"In view of the nature of this gas, and of such facts as are above related, and many more of a like character doubtless might be collected, I appeal to those who are advertising it as perfectly harmless, to say whether they can conscientiously continue to do so. I have not written this article from any selfish motives, but simply and only from the hope that a candid exposition of the nature and character of this gas might be instrumental in saving some victims from its deleterious, or even fatal effects. A. WESTCOTT.

"SYRACUSE, January, 1864."

DENTAL REGISTER OF THE WEST—FEBRUARY.

MICHIGAN DENTAL ASSOCIATION.—The ninth annual meeting of this Association, held January 19, 1864, at Jackson, Mich., was largely attended, and its proceedings of an interesting and instructive character; an appropriate address was delivered by Dr. Benedict on retiring from the Chair. Limited space only permits, however, the republication of the following excellent remarks of Dr. Robinson :—

"REMARKS of DR. J. A. ROBINSON, at the close of the meeting of the Michigan Dental Association.

"*Gentlemen of the Association:*—I thank you for your attendance to this meeting; and for the cheer and encouragement you have afforded us by your counsel and deliberations.

"When, at the close of your last annual meeting, I invited you, in behalf of the dentists of Jackson, to hold the next meeting in this city, I promised to do all in my power to make your visit agreeable and profitable; and I am happy to hear from so many that their most sanguine expectations have been realized.

"Dental associations should be cherished on account of their privileges; and they will be prized according to our capacities. When the retiring president remarked that a student of six months' growth had told him a few days ago that treating diseased teeth was a humbug, we all must have felt the necessity of demanding of those about to enter the profession, a more thorough dental education. Make it imperative upon the young dentist that he shall devote three years of study, or graduate at one of our dental colleges, and we need not fear for the character of those who call themselves dentists. We prize what we possess just in proportion to what it has cost us; and education is no exception to this rule. Many excellent operators have given half their lives and strength in trying to convert the world to the real merits of the profession, and in undoing what some worthless quacks have been trying in vain to do. It is not only important that the *dentist* should be educated, but it is equally so that the community should be well informed in regard to the real merits of our profession; for without a well informed clientele, the dentist, however worthy, will languish and starve. The most important means to be used to produce this result has been almost entirely neglected. We are a reading people; and while we have dental literature enough for our culture and improvement we should see to it that our patrons have suitable reading on the subject of dentistry to protect them against any impostors, who are always ready to promise to do what they are never able to perform. Let us circulate tracts among the people to stimulate them

to the importance of preserving their teeth, which are so necessary for their health, comfort, and good looks; for, next to our lives and liberties, our happiness depends somewhat upon a good set of teeth.

"Professional jealousies are always confined to the more ignorant; and education alone will enable us to rise above our catchpenny caterings to the prejudices and jealousies of the uninformed. Associated effort will protect us against any and all the difficulties we may have to encounter, and elevate our calling to a place among the honorable professions of the world."

"PLATES DISCOLORED IN REPAIRING. By A. BERRY, D.D.S.—In Dr. Talbert's communication in the last *Register* is the parenthetic remark, that he wished somebody would tell him how to remove the black deposit on plates after heating to repair them.

"In my dental reading I do not recollect to have seen anything on this subject previously.

"Attached very firmly to the plates, not acted on by acids, usually found in greatest quantity in depressions, about clasps, under and around the teeth, where it is difficult to act on it mechanically, the removal of this black substance involves much trouble.

"During several years, pieces that came into my hands for repairs were boiled in wood ashes and water, (having been told it would lessen the liability of breaking the teeth in soldering,) and I think the black deposit was not present on any plates so treated. They were enveloped in the ashes in a ladle, water put in to rise above the ashes, and heated to a red heat. In resoldering, the teeth seemed not to break so much as when invested as received from the patient. At least there was the advantage of breaking them generally before putting them under the blow-pipe.

"After abandoning this preparatory plan I usually washed the pieces to be repaired, and heated them quite hot by a fire or in a stove, before investing in plaster; but on heating, they generally had the troublesome deposit on them, although in less quantity than when cleansing was neglected before the investment. Probably boiling the plates a few minutes in an alkaline solution would remedy the difficulty.

"To remove the black substance, an active mechanical agent is required. I commonly use pumice-stone with pine sticks.

"By the way, will not some one give in the *Register* a mode of treatment to avoid breaking teeth when heating them for repairs?"

"Dr. Clippinger says:—Tell Dr. Talbert to soak his gold plates for a couple of minutes in sulphuric acid before investing them to solder. Then when he puts them in the acid to pickle or to remove the film, it will remove the other also, the heat and acid having destroyed it.—ED."

"OHIO DENTAL COLLEGE ASSOCIATION.—Our Alma Mater, the Ohio Dental College, is owned, as most readers of the *Register* know, by the above-named association. At a former annual meeting, committees were appointed to secure stock sufficient to liquidate the debt on the college property. These committees, at a late meeting, reported complete success. The stock is raised, and by the next annual meeting will, no doubt, all be paid in. The profession may well feel proud of such an achievement. The college building now stands as a monument of the enterprise and disinterestedness of the profession. By a unanimous vote, the stock was made 'non-interest bearing.' This will be a relief to the overburdened faculty, all of whom held their positions at a heavy sacrifice, if the

value of time is taken into consideration. But in their devotion to the cause of science, we have another illustration of professional earnestness.

"Now that the association is out of debt, all fears of the ultimate failure of the institution is at an end. It can't fail now; and the best thing to be done is for the profession in the West and Southwest to rally, as one man, to the rescue, and see that the college is properly supported, both with patronage and appliances. The indebtedness being gone, the same spirit, manifested for a year or two longer, will secure a library, apparatus and specimens that any institution might be proud of. Let the good work never stop. Let us remember that this association has erected the first edifice ever built for the single purpose of dental education. Its members may well be proud of their position. They are each a *founder* of an important institution, that is to take high and permanent rank in the grand race of civilization. Let us support and sustain the old college with a will. It deserves It. In blessing it we will more than bless ourselves."

The friends of dental education everywhere will read the above with much pleasure. The devotion to the cause, and the self-denial manifested under the most trying circumstances by the faculty of this school for a number of years, entitle them to the most decided support and encouragement on the part of the profession.

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WISCONSIN STATE JOURNAL.

"THE AGE OF SKILL.—We have seen artificial arms and legs both working moderately well, but we saw last night an artificial jaw, far ahead of all the wonders of utility and convenience that we have yet seen. It was in the mouth of Mr. Levi Shell, late of the 23d Regiment Wisconsin volunteers, who at the siege of Vicksburg had the right side of his upper jaw and teeth shot away, disfiguring his face very much, and rendering mastication very difficult. When he visited our office last night, with his artificial jaw snugly fitted on a vulcanized rubber base in his mouth, we did not at first recognize him, having been accustomed to see him with a sunken and much deformed face. Not only has he regained his appearance, but a jaw that he says in eating and other operations works admirably; and he has gone to his home at Prairie du Sac, rejoicing. The successful dentist, whose skill has done so much for this war-maimed soldier, is Dr. Moody, of this city."

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AMERICAN.

"DENTAL.—Delegations of dentists from neighboring cities of Concord, Nashua, Lowell, and Lawrence, have visited the dentists of this city to-day. Among the subjects discussed was that of the extension of American Hard Rubber Company's patents, which is now being urged by the agents of the companies at Washington. This is a subject of interest, not only to dentists, but to everybody who uses any article of Vulcanized Rubber, from a pencil case up through all the thousand of articles made of that material. We understand they (the dentists) have engaged G. W. Morrison, Esq., to prepare a Remonstrance to be circulated for the signatures of men of all professions interested in this matter, to be sent to our members of Congress. The patents have already been renewed, we believe, twice. The last term will expire in one year from May next. We are glad to see the dentists lead off in this matter.

"MANCHESTER, March 16th, 1864."

PERISCOPE OF MEDICAL AND GENERAL SCIENCE IN THEIR RELATIONS TO DENTISTRY.

BY GEO. J. ZIEGLER, M.D.

"*Structure and Classification of the Mammalia.*—After a few introductory remarks, in a lecture on this subject, at the Royal College of Surgeons, PROFESSOR HUXLEY stated that further observation and reflection had served to convince him more fully of the truth of the tripartite division of the vertebrate sub-kingdom, which he had announced in the lectures delivered at the college last year. The first section or province, (*Ichthyopsida,*) containing the Fish and the Amphibia, all possess, he said, branchial respiratory organs, at least at some period of their existence: in the embryonic condition they are without amnion, and the allantois is absent or rudimentary, their blood corpuscles are nucleated, and their lower jaw does not articulate directly with the skull. The members of the second province, comprising the classes Reptilia and Aves, (*Sauropsida,*) never possess branchiæ; have the amnion and allantois well developed, the latter generally taking on a respiratory function; their blood corpuscles are nucleated; each ramus of the lower jaw is composed of several pieces, and articulates by means of the quadrate bone with the skull; they have a single occipital condyle, and the appendages of their epidermis take the form of scales or feathers. The third division contains the Mammalia alone; these never have branchiæ; the amnion and allantois are always developed; the large majority of the blood corpuscles are non-nucleated; each ramus of the lower jaw is simple, and articulates with the squamosal element of the skull; there are two occipital condyles; the epidermal appendages are in the form of hair, and the females have mammary glands. As far as our present knowledge extends, both of living and extinct vertebrate animals, these three great groups are absolutely defined in nature; while, on the other hand, between fish and amphibia, birds and reptiles, respectively, numerous points of affinity may be found.

"The class Mammalia being the subject of the present course, Man, as the form with whose anatomy most of the audience were best acquainted, was selected as a type, and a sketch of the salient point of his structure was given first, to assist in following out in subsequent lectures the various modifications of organization found in other mammals. The lecturer commenced a description of what he termed the 'zoological anatomy of man,' (having especial reference to those parts which offer the best terms of comparison in descending through the mammalian series,) by stating that that which first strikes the most superficial observer of the human body, is the erect attitude. This alone, however, is not distinctive; it is shared by the penguin and kangaroo, but in these animals the body is suspended on the flexed femur; the vertical trunk placed on an extended hind-limb is peculiar to man. The principal remaining external zoological characters of man are—the plantigrade sole, the backward arching of the spine in the dorsal region, the hollow in the lumbar region, the wide chest, the muscular prominences formed by the powerful abductors of

both pairs of limbs, and the peculiar proportions of the body, the length from tip to tip of extended anterior extremities equaling the height, the vertical central point being a little below the symphysis pubis, the whole height being seven or eight times the vertical height of the head, the legs being longer than the arms, and the proximal segments of both limbs longer than the distal. The pollex is perfectly free and opposable, and does not lie in the same plane as the other fingers; the palm is very nearly square; the carpus is shorter than the metacarpus, this shorter than the digits; the forearm capable of free rotation. In the lower limbs, the hallux is only imperfectly mobile, and scarcely at all opposable, and lies nearly in the same plane as the other toes; the second toe is generally the longest; the sole is longer than broad; the tarsus longer than the metatarsus, this longer than the digits; there is more or less union by integument or 'syndactyly' of the three middle toes. One of the greatest peculiarities of the human body is the distribution of hair upon its surface; on the head this is more abundant on the dorsal than the anterior aspect, on the body more developed in front than behind, on the limbs more on the extensor than the flexor surfaces, without relation to front or back. The nails are comparatively flat, and do not cover the whole surface of the phalanx on which they rest. The septum of the nose is narrow and elongated, causing the external projection of the organ; the nostrils are directed downward. * * * *

"The special zoological characters of the human skeleton are as follows:—The spinal column consists of thirty-three vertebræ, of which seven are cervical, twelve dorsal, five lumbar, five sacral, and four coccygeal. In the adult state it forms a double sigmoid curve, caused, in the dorsal and sacral regions, by the conformation of the vertebræ,—in the cervical and lumbar regions, by the elasticity of the *ligamenta subflava* connecting the posterior arches. In the skull, the occipital condyles are placed, if not exactly in the centre, within the middle fifth of the base, being slightly behind the centre in the lower races. The mastoid processes are largely developed. The cranio-facial angle in well-formed skulls is about 90°, and probably never exceeds 120°. In consequence of the enormous size of the cerebral cavity, the length of the head is always more than twice the length of the basi-cranial axis. In the interior of the skull the ethmoid and presphenoid meet in the floor of the cavity, and are not concealed by the frontal; the inner surface of the petrosal has no fossa for the lodgment of a process of the cerebellum; and the planes of the occipital foramen, cribriform plate, and tentorium are parallel to one another. The hyoid bone is comparatively narrow from above downward, and, though concave posteriorly, not deeply excavated. In the limbs the pectoral arch has a well-developed clavicle, and a large and broad scapula; the humerus has a large globular head, and at the lower end a rounded facet upon which the radius plays, allowing free pronation and supination. The form of the pelvis is eminently distinctive,—the breadth and curvature of the sacrum, the great extent and concavity of the inner surface of the iliac bones, the sigmoid flexure of their upper margin, the mode in which the pelvis is set on the spinal column, the breadth of the upper aperture, and the width and shortness of the whole cavity, may specially be noted. In the lower extremity may be observed the great angle at which the head of the femur is set on its shaft, the greater length of the internal than the external condyle, the

flatness of the upper surface of the tibia, the form of the ankle-joint, and the downward projection of the malleoli.

"To sum up the peculiarities of the human skeleton, we find that its special characteristics, as distinguished from those of the general Mammalian type, have all (leaving aside the upper extremity) reference to the erect posture. To this end contribute the form of the ankle-joint, of the upper surface of the tibia, of the condyles and head of the femur, and of the pelvis; the curvatures of different parts of the spinal column, the position of the ribs, the breadth and flatness of the sternum, and the situation of the occipital condyles. Moreover, related to the same posture are the absence of great bony crests on the skull for the attachment of the muscles which support the head in the lower animals, the smallness of the jaws and teeth, and even the great mass of the brain, which would be of little avail unless the anterior pair of limbs had been set free to carry out its requirements."—(*Med. Times and Gaz.*)

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Colorless Corpuscles of the Blood.—In an abstract of a paper on this subject read to the Microscopical Soc. of London, Dr. Beale "commenced by stating that the germinal or living matter, of which all nuclei, and in some cases what had been termed cell-contents, consists, always exhibited a tendency to assume the spherical form: that whatever shape this germinal or living matter was made to take by pressure of external matter, if placed in a fluid about its own density, it always becomes spherical. The white corpuscle of the blood, like other forms of living matter, if carefully watched, may be frequently detected forming projections or outgrowths upon its surface, almost like the amœba. The moving power, Dr. Beale thinks, resides in the most minute particles of this living or germinal matter, and that although contained granules may be observed in active motion, the movement communicated to them by the minute spherical particles of living matter does not depend upon the mere molecular movements of the granules themselves. Dr. Beale believed the little highly refractive particles which give to the white blood corpuscle its granular appearance, to be dead formed material, resembling fibrin—for whereas the living germinal matter could be colored by a solution of carmine, the granules could not, and this he looks upon as a test for the germinal matter. In a clot of blood stellate cracks are often seen between the surrounding colored corpuscles converging toward a colorless corpuscle. He believes their appearance to result from the white corpuscle absorbing nutrient material from the *liquor sanguinis*, the cracks or fissures being the channels through which the streams of nutrient matter flowed. In inflammation the increase of white corpuscles in the capillaries is enormous, and Dr. Beale believes they have the power by budding of increasing in number, even after the death of the animal. In favor of this view he instanced the case of a clot of blood, which, if examined immediately after death, would be found to contain a certain number of colorless corpuscles, but when examined a few hours later a greater number might be observed. He also stated that the periosteum of the fang of an inflamed tooth was a very favorable position for observing the formation of white corpuscles in young vessels. Dr. Beale believes that the white corpuscles multiply in the circulation, especially in such positions where it is slow and sluggish—for instance, in the spleen. He thinks that they are formed from the germinal matter of the

walls of the vessels, as well as by subdivision, and the formation of buds on the part of the white corpuscles. Dr. Beale then entered upon the 'Exudation' and 'Cell' theories, as applied to morbid products in inflammation. He thought that minute living particles passed through the stretched walls of distended capillary vessels, and that these living particles grew and increased in the exudation after its escape. Hence he could accept neither theory, since the 'exudation' contained solid living particles, but these living particles could not be considered 'cells,' for they had not the structure, nor were they produced in the manner which those who accept the cell theory believe cells to result. He then stated, that besides the white and red corpuscles of the blood, the *liquor sanguinis* contains an enormous number of the extremely minute particles just referred to, and he hazarded the opinion that it was such living active particles that we were to regard as the active animal 'ferments' which give rise by the so-called 'catalysis' to contagious and infectious diseases, as small-pox. These germs might pass in a living state from one person to another, and multiply. There could be no more interesting field for investigation than this. He then went on to state that every living particle is derived from some pre-existing living or germinal matter; that the formed material on the other hand was dead matter; and that in it chemical and physical changes occurred, but not the so-called *vital actions*, the latter being confined to the germinal matter alone. The living or germinal matter of the white corpuscles in the blood, if allowed to die very slowly, under certain conditions became resolved into the hæmato-crystalline of which the red blood corpuscles were composed. This, as is well known, readily assumes the crystalline form. If the death of the living matter occurred more quickly, the result was fibrin, so that the formation of fibrin was a vital process—in fact, that the germinal matter in dying became fibrin. * * * * * *

"Dr. Beale's elaborate paper was received with acclamation by the members of the Society, and an interesting discussion followed, in which Dr. Carpenter joined, letting fall some very interesting remarks, approving highly of Dr. Beale's inferences. The white corpuscle of the blood was likened to an amœba, and its movements to those occurring in that creature and in many of the Rhizopods. * * * * *

"Mr. Harry Lobb said the white corpuscle of the blood was more important to study than the red, the former being formed in the blood of all creatures, whereas the red was not universal. He also stated his belief that the colored corpuscles in living blood were highly electrified bodies, whereas the colorless were not so."—(*Electrician* and *Dublin Med. Press.*)

"*Caries and its Relations to Necrosis.* By WILLIAM S. SAVORY, F.R.S., Assistant Surgeon to and Lecturer on Physiology at St. Bartholomew's Hospital.—Every one knows with what consummate skill Virchow has set forth the doctrine that 'fibrin generally, wherever it occurs in the body external to the blood, is not to be regarded as an excretion from the blood, but as a local production.' Although at first sight this may have appeared startling, and although a full and fair consideration of the facts before us, and of the arguments he employs, will probably lead to the conviction that it cannot be unconditionally accepted—that this proposition cannot be received in an unqualified form—yet Vir-

chow's views are not perhaps so opposed to the current doctrine of exudation as they have to many appeared to be. Of course Virchow assumes that the original source of supply is the blood in the vessels of a part; but he maintains that there is no effusion of lymph or plasma in the common acceptation of the term. Again, all that is known leads to the belief that the lymph or plasma or nutritive matter—call it what you will—is not a mere overflow from the vessels, but is in some way attracted therefrom by the tissues into which it passes. The tissues affected are not mere passive parts, like inundated land when a river overflows. We can recognize the full force of, and without hesitation subscribe to, the following:—'It is only when we conceive the absorption of nutritive matter to be a consequence of the activity (attraction) of the elements of the tissues themselves, that we are able to comprehend how it is that the individual districts are not exposed every moment to an inundation on the part of the blood; but the proffered material is, on the contrary, taken up into the parts only in accordance with the requirements of the moment,' etc.* After Virchow has shown 'how essentially the activity of the elements of the tissues themselves is concerned in the appearance of matters,' he continues, 'which we certainly must regard as derived from the vessels and deposited in the parts affected. A good deal is, as we have seen, not so much exudation, as, if I may so express myself, an educt from the vessels in consequence of the activity of the histological elements themselves.' Nevertheless, although this increased attraction between the matter within and without the vessels, or excessive action in the surrounding parts, must be admitted to account for the fact, we may still conveniently speak of effusion or exudation, seeing that in such cases the supply is far in excess of what is required or furnished in health. This is but extending to morbid or abnormal actions the laws which prevail in healthy normal nutrition. The supply is determined by the demand.

"Still, is there not something like a relapse into the old error of believing that the vessels themselves of a part regulate the supply of blood to it, in Virchow's views of the offices of cells, and his ingenious idea of cell territories? That each connective-tissue corpuscle, or, to refer more particularly to bone, that each bone cell, in its lacuna and canaliculi, serves to supply a definite district, may well be believed without admitting that the nutrition of that district is thus directed or governed. The cells, or lacunæ and canaliculi, are but extensions of the vascular system, supplying according to the demand which arises in the tissue itself.

"Our knowledge of the vascular system has been wonderfully extended by the discovery of the 'juice-conveying system.' The existence of these ramifying and anastomosing cells of connective tissue everywhere in the interstices of the proper capillary network may be accepted as a fact; but the view taken of, and the powers attributed to, this system by Virchow is another matter. Is it not an error to regard these cellular elements as active agents presiding over the nutrition of the surrounding parts—the intercellular substance, whatever that may be—each so-called cell governing and directing the changes which occur within its territory? Is not this, it may be asked, an exaggeration or misconception similar to the old one, which formerly attributed like powers to the blood-vessels themselves; as, for example, normally, in regulating nutrition, and abnormally, in the part they play in inflammation?

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* Virchow's Cellular Pathology, translated by Dr. Chance, 1860, p. 108.

"Is it not more correct to believe that the juice-canal system is only a more delicate extension of the vascular system, standing in the same physiological relation to the parenchyma as the capillaries themselves are now believed to do? Does not this system constitute similar but more minute and penetrating channels of supply, adjusting this to, but not directing, the demand? This arises in the very substance which is the actual seat of the changes involved in nutrition.

"But although we may not admit Virchow's view of the relation of cells to the surrounding substance, we can readily accept the admirable description which he gives of the changes that occur in necrosis and caries. He shows how, in these cases, the line of demarkation of the morbid changes is determined by the limits of the several 'cell territories.' Without admitting that the bone corpuscle 'in proportion as it underwent transformation itself, also determined the surrounding parts to enter upon the change,' one can understand how in caries 'the bone breaks up into its territories;' how, in necrosis, 'when the line of demarkation forms . . . . the surface of the bone, when viewed along the edge, becomes marked with excavations, the extent of each of which corresponds to the original cells.'

"It is remarkable that, although the analogy which exists between the diseases of bone and those of other tissues has been long since clearly recognized, although it is understood that the diseases of bone are of the same nature as those of other parts, only here, as elsewhere, modified by the structure they affect, the relation of caries to necrosis has attracted so little notice. For every one is familiar with the close relation which exists between ulceration and mortification of the soft parts, how the one passes by insensible degrees into the other through the various forms of phagedenic ulceration and sloughing phagedena. It is well known that death by molecules, as in the various forms of destructive ulceration, may gradually pass into death by masses, as in gangrene.

"Whatever the precise signification may be which is attached to the term caries, whether it be held to be synonymous with ulceration in the widest acceptation of the term, or whether it be restricted to those forms of ulceration which are destructive of the parts involved, no fact has been more often insisted on than that the process in bone is, in its nature, identical with that which occurs in the soft parts. So with necrosis, which is simply the process of mortification in bone. Even the analogy of the process of exfoliation to that by which a slough is separated from living soft parts has for a long time been clearly rocognized. Why, then, are these two morbid processes viewed so entirely apart? Why are these diseases made so distinct in pathology and surgery? Surely they are not naturally so separated. It would be worth while to investigate more thoroughly their points of contact. The points of contrast have been summed up often enough.

"Broadly speaking, it may be said that in the worst forms of destructive (phagedenic) ulceration there is the death and separation of invisible particles; in mortification there is the death and separation of visible portions of tissue. But the relative rate at which these two processes generally proceed may probably in great measure determine the different condition of the dead and ejected portions. Parts separated by mortification appear to be simply dead. Particles separated by ulceration appear to have rapidly degenerated and disintegrated.

"In both caries (using this term in its more restricted sense) and ne-

crosis, as in phagedenic ulceration and mortification of soft parts, there is loss of substance; but while in the former case a cavity is produced, in the latter the dead portions remain as sloughs or sequestra. Moreover, the diseased surface is, as a rule, less defined in the former than in the latter case; for the distinction between dead and living parts is more strongly marked than the distinction between parts which are subjected to different rates and degrees of degeneration.

"As in soft parts the two processes may be concurrent—*e.g.* sloughing phagedena—so in bone; and this is a point of great interest and importance. Caries of bone is often accompanied by the separation of visible fragments. Such fragments are often found in carious cavities. Again, the size of a sequestrum frequently bears no comparison to that of the cavity in which it is contained. The fact that a very small portion of dead bone is sometimes found in a very large cavity, has, we know, been strongly appealed to in support of the doctrine that dead bone may be absorbed.

"Hence the frequent difficulty, nay, sometimes the impracticability, of distinguishing between the two by the local signs. There are no distinctive external characters between caries and necrosis.

"The best informed and most careful surgeons are sometimes doubtful of the presence of dead bone. Operations are sometimes performed for the removal of dead bone when no portion of dead bone is found. The difficulty is explained, if the failure be not justified, by a consideration of the relation of caries to necrosis.

"There can be no doubt that many operations performed for the removal of sequestra, and in which the end has been completely accomplished, have nevertheless failed to cure, because the walls of the cavity have remained carious, and have thereby continued to extend. In some instances, no doubt, where all had been previously quiet, caries has been set up by the irritation of the operation.

"The examination of a sequestrum will of itself, I think, furnish conclusive evidence that simple necrosis must be extremely rare,—that it is almost always associated with caries. How otherwise can its worm-eaten appearance be explained? How can the extensive and irregular excavations which penetrate it through and through in all directions be accounted for except by admitting the fact, that while large tracts of bone were destroyed by caries, other portions perished more rapidly in masses, and were cast off as dead bone? For be it observed as most important to this view, that the extent and form of the cavity in which the sequestrum is lodged is not proportionate to the size and shape of its contents. Elevations in the one are by no means always, or even generally, found corresponding with depressions in the other. It might, indeed, be imagined that portions of bone originally perished in a most irregular manner, as indicated by the shape of sequestra, and that the corresponding irregularities of the living bone were subsequently removed by a process of healthy absorption so as to produce a more level and uniform surface. But a careful examination of necrosis in its earlier stages furnishes no evidence of this. On the contrary, the adaptation of the living to the dead bone is more obvious at last than at first, for at length the cavity in the healthy bone tends to close in, and is filled up in those parts where the growth is not impeded by the presence of the sequestrum. Thus the shape of the cavity is subsequently more or less adapted to that of the sequestrum. Nay, further, sometimes a small but

deep excavation in a sequestrum is found to be filled by a mass of granulation substance which has grown into it from the adjacent living bone: a fact otherwise of great interest in relation to the possibility of the absorption of dead bone, but also important to the question before us; for there can be no doubt whatever, as an examination of it will prove, that this is a new production—young tissue—incipient bone. So then we must admit, as a rule, the association of caries with necrosis.

"What causes determine between caries and necrosis?

"Among others may be recognized the texture of bone—its density. It can be readily understood that there is less scope for change, less power of adaptation to the morbid processes which supervene in the dense, compact, than in the more open cancellous tissue of bone. Hence the effects of any disturbance of nutrition are more abrupt and severe. There is but little attempt at compromise, and a part dies outright. Therefore inflammation, or any other condition which disturbs the normal nutrition of bone, is, other conditions being equal, liable to be followed by necrosis in proportion to the density of the tissue affected. Thus, when bone has become indurated from chronic inflammation, a careful examination will often detect small flakes exfoliating from the surface. The morbidly indurated bone seems now unable to resist the influence of very slight disturbing causes.

"By the way, this condition has more than once led to errors in diagnosis. The general symptoms of chronic inflammation are in great measure those of necrosis,—indeed, pathologically, these processes differ only in stage and degree,—and when bone, and perhaps movable bone, is detected by a probe, through, it may be, more than one fistulous aperture, the case is apt to be regarded as one of ordinary necrosis, and an operation of unnecessary magnitude undertaken. The following case was to me a very instructive one.

"A man, aged thirty, apparently in robust health, had suffered for two or three years from the symptoms of inflammation followed by necrosis of the radius. When I saw him, the forearm was somewhat enlarged, and the radius in its whole extent was obviously very much thicker than its fellow. Three or four fistulous apertures on the front surface of the forearm led to bare bone, which in some places appeared to be movable. The conclusion was drawn that there was dead bone, which might be removed by operation. The gentleman who had charge of the case, wishing to be away from the larger vessels and nerves, cut down to the radius on its outer and back part, and exposed the surface of very dense and roughened, somewhat tuberculated, bone. Regarding this as new bone which invested the dead portions, he endeavored to penetrate it with chisels and gouges, and after having, with much labor—for the bone was wonderfully hard—cut away a portion to some depth, it appeared that no cavity existed, but that the bone was solid throughout. Then a careful dissection was made round to the front surface, where the loose bone had been felt, and three or four small loose flakes were detected, and at once removed with the forceps. It was obviously a case of chronic inflammation of the radius, succeeded by the exfoliation of thin plates from the surface. Happily all afterward went on well. The fistulous apertures closed. The man rapidly recovered, and regained a useful arm. I have reason to believe that other cases of a like kind have occurred.

"Now, of course, the more formidable part of this operation would have been avoided had the operator kept closely to the fistulous apertures, re-

gardless of what he considered the objections to this course. This plan, when practicable, should be rigidly carried out. No trifling difficulty should drive the operator away from the track of the fistulous canals.

"It is said 'caries from a scrofulous cause, generally, if not always, commences in the cancellated structure; that from syphilis affects the firmer and more external parts of the bone. The former attacks the ends of the long bones, and the spongy and cuboid bones generally; the latter, the centres of the long bones and the flat ones.' But it is interesting and significant that with syphilitic caries necrosis is often associated, the denser layers—the external table of the frontal bone, for instance—exfoliating, and the exposed cancellous texture extending by caries.

"Activity of the morbid process. Just as elsewhere, the more intense the inflammation, the greater the risk, other conditions being equal, of the death outright of the parts involved. Hence the frequency with which necrosis waits upon acute inflammation of bone, and the much more common association of caries with chronic inflammation. So, as a rule, necrosis which has been preceded by acute inflammation is more favorable subsequently for operation than that which follows upon more obscure symptoms which have endured for a greater length of time. And, for the same reason, in the prognosis of a case of necrosis, and in calculating the chances of complete cure by operation, the cause of the necrosis is of great moment. For example, necrosis succeeding injury is more likely to be well defined and uncomplicated with caries than that which is the result of disease.

"There can be no difficulty in understanding why, in young children, inflammation of bone, especially when provoked by external causes, is so acute and so rapidly followed by necrosis of the whole portion involved, as in the case of a shaft of a long bone,—the tibia or femur. The normal nutrition of the young and growing bone is, of course, very much more active than afterward. Morbid changes are therefore energetic to a corresponding degree."—(*Lancet.*)

Hereditary Syphilis.—"Mr. de Méric read a paper to the Medical Society of London, on the Occasional Non-transmission of Syphilis to the Offspring. The author brought forward sixteen cases of non-transmission, which were arranged in the following groups: Seven cases where the father alone suffered from syphilis, the mothers and children escaping unhurt. Five cases in which both parents were affected with the disease, and the offspring showed no trace of the complaint. One case where both father and mother presented symptoms of syphilis, and the child was born and remained healthy; this case being detached from the last group on account of a peculiar circumstance—namely, the father having been contaminated by the mother *after* conception had taken place. And lastly, three cases in which the earlier children had the disease, and some who were born subsequently did not present symptoms of it. Mr. de Méric commented on these cases, especially as regarded the aptitude to marriage of persons who have suffered from constitutional syphilis. He considered that very consoling conclusions might be drawn from the cases he had offered to the attention of the Society.

"Dr. Chowne eulogized the paper, and was glad that the occasional immunity of children had, by its author, been made so manifest; he inquired, however, up to what period we could consider the children safe

from any attack of syphilis. Dr. Chowne also touched upon the controverted point of mercurial treatment; and afterward alluded to the non-transmission of the hereditary taint of syphilis by parents presenting severe tertiary symptoms, wishing to know the theory of this exemption.

"Dr. Gibbon asked whether Mr. de Méric had examined the children as to the new signs of hereditary syphilis which had been pointed out by Mr. Hutchinson. He also stated that he knew, from actual cases, that when only one of the parents was affected, the child, if diseased, would bear a likeness to that parent; but if it escaped without taint, it would be like the sound parent.

"Mr. Walter Coulson had observed, in his practice at the Lock, that tertiary symptoms of a very aggravated kind were not, as a rule, transmitted to the offspring, and he gave a very striking example of the kind.

"Mr. Mason had known several children in a family to die skin-bound, and stated that the medical man in attendance had conceived that this state of things might be owing to hereditary syphilis.

"The President favored the meeting with the history of a case where the shafts of both humeri and the shaft of the thigh-bone had been fractured by very slight causes in a child eight months old, whose parents both suffered from syphilis. He inquired whether this brittleness of bones could be connected with hereditary taint. The President added that those parents saw hardly any improvement in their symptoms; and it was noticed that, notwithstanding this circumstance, the children born after the one mentioned remained in good health.

"Dr. O'Connor corroborated Mr. Walter Coulson's statements, and some of Mr. de Méric's cases, as to the occasional immunity of children born of tertiary parents.

"A Member thought that the immunity of which Mr. de Méric's paper gave illustrations was perhaps not so rare as was supposed, as he (the Member) had attended more than three thousand cases of midwifery, and had not observed any cases of hereditary syphilis.

"Mr. de Méric, in his reply, stated that the time when a child born from contaminated sources could be pronounced beyond the likelihood of an attack of the disease was by no means fixed. He had himself recorded cases, in his Lettsomian Lectures, in which the taint became manifest at from six weeks to ten years; but he was inclined to believe that the late cases might have been contaminated in a direct and not hereditary manner. He was glad to find that others had observed the immunity of children in some cases of tertiary parents; and he would note the fact mentioned by Mr. Mason, of skin-bound children being *thought* to be hereditarily tainted. He would only add that the gentleman who had attended the three thousand cases of midwifery might not perhaps have had an opportunity of watching the children sufficiently long to judge of their ultimate state of health."—(*Ibid.*)

"*On Ozœna and its Treatment.* By Professor Trousseau. — The horrible fetor of the breath which constitutes ozœna is an infirmity so odious, and unfortunately so common, that the physician ought, from the very commencement of his career, to make himself acquainted with the causes and treatment of this condition. In the first place, we must be careful not to confound ozœna depending upon the condition of the nasal fossæ with the fetor of the breath caused by some affection of the mouth

or throat. It is not, however, always easy to avoid error. The simplest diagnostic means is to direct the patient to close his mouth and nose alternately during expiration; it is then generally easy to determine the source of the fetor. This method may, however, prove insufficient, because the vitiated secretions of the nasal fossæ may fall back into the pharynx and communicate their disagreeable odor to the air which passes through that cavity. The physician, however, who has seen a few cases of the kind, will have no difficulty in recognizing the condition in question, for the odor is quite peculiar, so much so as scarcely to admit the possibility of mistake. This specific odor is, however, chiefly associated with that form of ozœna which is called constitutional, and which is specially associated with the scrofulous or herpetic diathesis.

"All the secretions which are in contact with the air become altered in their composition if they are not renewed, and this alteration is more considerable in some persons in virtue of conditions which it is not easy to indicate, but which depend as much perhaps on the quality of the secretion at the moment it is formed, as on the special nature of the secreting organ. The nasal secretions in some persons alter with great rapidity, and contract an extreme fetor which will not be observed in other persons though much less particular as to the details of the toilet. Ozœna sometimes depends upon this cause; when the nostrils have been cleared of their secretions, the breath is pure; a few hours later it becomes foul if the matters are allowed to accumulate in the nasal fossæ. The remedy for this condition is not far to seek; it consists in using the pocket-handkerchief frequenlly, and cleansing the nose thoroughly.

"In some persons, the secretions of the mucous membranes in the normal condition have, like that of the skin, a remarkable fetor; if these parts are attacked with inflammation, acute or chronic, the fetor becomes much exaggerated; you may be often struck, for example, with the foul odor of a gonorrhœal discharge. This fetor persists as long as the inflammation is acute, and indeed sometimes persists after it has become chronic. Thus, in some persons, as soon as they contract a coryza, the secretions from the nostrils become of very offensive odor.

"The ozœna called constitutional is rarely observed during infancy, even although there should exist at birth some of the anatomical conditions which lead almost certainly to it. It is rare that the condition is established before the fourth or fifth year; it increases toward puberty, continues during adult life, and diminishes but does not disappear completely in old age. This form is distinguished by a fetor peculiar to itself; the nasal secretions are usually purulent, sometimes they dry up and form crusts which mould themselves to the interior of the nostrils, and there is usually a little bleeding when they are discharged. The purulent discharge is often very abundant, though it is right to mention that it is not in these cases that the odor is most disagreeable unless the ozœna be connected with a disease of the antrum, in which the matter remains, and which is discharged in streams on certain movements of the patient. Almost always on examining the nasal fossæ by means of a small speculum, the mucous membrane will be found reddened. Ozœna has sometimes been ascribed to contraction of the nostrils due to depression of the root of the nose, but there are many persons in whom the nostrils are extremely narrow, and yet in whom the nasal secretions have never a disagreeable odor.

"In other cases, rarer no doubt, the nasal secretions appear quite the

same as in other people, and at the same time there is no indication of any inflammatory affection, acute or chronic. Under such circumstances, where there is no inflammation of the pituitary membrane, no necrosis of the bones of the nose, where the individual appears to be in perfect health, where the nasal secretions have a peculiar fetor, just as the perspiration from the feet has in some people, we are forced to admit the existence of a constitutional ozœna. Next to this form we must range that which depends upon a herpetic diathesis, and which is generally associated with scrofulous ophthalmia, and swelling of the upper lip. Not that every eczematous affection of the nostrils will occasion ozœna, but just as in some persons eczema of the feet, the vulva, etc. produces secretions of a revolting odor, so in some individuals affected with eczema of the mucous membrane there is a discharge of a most fetid character.

"Of all the causes of ozœna the most frequent is certainly syphilis. In constitutional syphilis coryza is very frequent; although in the great majority of persons it does not give rise to fetor of breath; it may do so, just as eczema and scrofula in certain persons. Syphilitic ozœna is also important in this respect, that more than any other form it leads to ulcerations and necrosis. Necrosis, whether due to syphilis, to gunshot wounds, or to fractures, may lead to ozœna. The last condition to be mentioned is disease of the antrum. This account of the causes of ozœna is no doubt very imperfect; it was, however, necessary to premise it before passing to a consideration of the therapeutic means, by the aid of which we sometimes cure and often palliate this cruel infirmity.

"In the first place, it must be understood that we can do little in the case of ozœna which depends upon necrosis of the bones. The dead bone will come away in whole or in part, and the odor will continue as long as any portion of the dead bone remains. It is sufficient to cast a glance at the bones of the head to see how difficult the expulsion of certain portions must be. An ulceration, a necrosis of the walls of the antrum, or a chronic inflammation of the mucous membrane which lines it, will also produce an ozœna, for the cure of which we can do little, and in the greatest number of such cases surgery alone can intervene by penetrating the antrum from the upper row of teeth. In all cases where we can attack the cause of the inflammation of the pituitary membrane, and where there are as yet no osseous lesions, the cure is easy; thus in syphilitic coryza without ulceration, mercurials, or iodide of potassium, will soon remove this condition. But where we have to do with a herpetic ozœna we have no longer any specific remedies, and the condition is often incurable. By means of arsenical or sulphurous preparations, or iodine, we may do some little good, but it is to topical remedies we must chiefly trust. It is still more difficult to contend against the strumous diathesis, and though we may produce some modification of the constitution, by placing the patient in favorable hygienic conditions, and administering some of the ordinary remedies, we must reckon almost exclusively upon those agents which address themselves directly to the affected mucous membrane.

"Powders inhaled in the same way as snuff, the direct application of caustic to ulcerated points, injections of different kinds, are the means which have proved most effectual. Not that a cure is easy, far from it, or that it can be obtained in a short time; but, however imperfect the method, we arrive occasionally at relatively good results, which we are glad to have obtained."—(*Edin. Med. Jour.* and *Dublin Med. Press.*)

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Anæsthesia from Chloroform prolonged by the Hypodermic Injection of Morphia. "Translated by Dr. Homburg, Cincinnati.—The following observations of Professor Nupbaum, of Munich, are likely to prove of vast importance not only in chirurgical, but also for internal medical treatment, for instance, in reference to the therapy of the tetanus, various neuroses, etc., yea, even in experimental physiology. Since it appears to us desirable that the valuable experiments in question should be confirmed by other surgeons and physicians so that experiments may be had in the most varied manner, we hasten to communicate them briefly, even without waiting for a greater number of cases bearing thereon.

"Professor Nupbaum removed about three weeks ago from a patient aged forty, a miller, residing in Foelz, a great sarcomatous tumor on the neck, using chloroform in the usual manner. To silence pains after the operation, which required a complete separation of plexus cervicalis, he injected beneath his skin, while still under the influence of chloroform, one grain of acetate of morphine. The person operated upon did not subsequently—as usual—awaken from his narcotism, but slept on, breathing regularly and calmly, uninterruptedly, for twelve hours. He endured during this sleep the deepest stitches of the needle, incisions into the skin, and the application of red-hot iron, etc., without even the slightest reaction against the same. Finally, he awoke from deep slumber, exactly as if he had just passed through a chloroform narcotism.

"A few days later, Prof. Nupbaum most pleasingly surprised at this exhibition, and the effect just stated of subcutaneous application of morphine on a second patient, a Mr. M., in Swabia, upon whom, in consequence of a cancer, he had just executed the resection of the upper maxillary bone without removing the alveolar process during the chloroform narcotism, and had finally, on account of cancerous irritation in the facial skin, undertaken a transplantation in the neighborhood of the temples and forehead by closing the wound. This patient, too, slept with complete absence of all feeling during eight hours amid the most quiet breathing. His pulse remained in rhythm and number perfectly regular. The effect of the narcotic appears the more surprising in this case, because the same dose of acetate of morphine had a few days previous been injected hypodermically without producing sleep, and still less anæsthesia.

"Two other cases embrace a woman fifty years old, and a seven year old boy, upon both of whom only about half a grain of morphine had been subcutaneously injected; and both slept from five to six hours the same quiet sleep, and enjoyed an equal anæsthetic condition. Another case, in which the experiment in question failed, has up to now not been observed by Professor Nupbaum.

"From the preceding observations appears to arise a physiological experimental point, that must on further use tend doubtlessly to most gratifying results. Obviously it appears as if the hypodermic application of morphine, and perhaps of other narcotics, for instance, of atrophia, might during the chloroform narcose preserve for several (six to twelve) hours that peculiar condition of the central nervous system, of which we know—it is to be lamented—as yet so little, and which is temporarily produced by the effect of inhaled chloroform, and to do this by greater or lesser doses of morphine; as long at least as the effect of morphine is maintained; and of course also the arracothesy, which to produce through

the inhalation of chloroform is, as well known, one of the most beneficent inventions in aid of suffering humanity."—(*Cincinnati Lancet & Observer.*)

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"*Galvanism in Tetanus.*—The celebrated Italian physiologist, Matteucci, has addressed a communication to the French Academy of Sciences upon the employment of the continuous electrical current in the treatment of tetanus; and in a note to M. Flourens he earnestly begs that the attention of physiologists and physicians may be turned to the subject, as he firmly believes that a therapeutical procedure will result, which, if it do not effect a cure in this terrible disease, will, at all events, produce great diminution of suffering. Seeing recently, in an American journal, the fact stated, that the continuous current had been advantageously employed in a case of hydrophobia, he called to mind a case of tetanus published many years since by Nobili and himself. It is well known that a condition of tetanic contraction may be excited under two circumstances, viz., the interrupted passage of the electric current into the nerves and muscles of an animal at very short intervals, and the continuous passage of the current into the nerve in the opposite direction to its ramifications. It has been the object of some of Professor Matteucci's communications in the *Philosophical Transactions*, to explain how this is brought about by the production of secondary polarities. What, however, we have to do with at present is the fact that a nerve which has in this way acquired the property of exciting tetanic contractions, instantly loses such property as soon as it is submitted anew to a continuous current. Reasoning from analogy, it was thought that tetanus might be assimilated, as regards the state of the nerves, with the condition of an animal in which interrupted currents or a continuous inverse current have been employed; and the hope was entertained that a direct continuous current would produce the cessation or diminution of the contractions in the one case as in the other. And so in effect it was found that the patient, while he was subjected to a continuous electric current from 30 to 40 pairs of plates, no longer suffered the same violent convulsions, and was able to open and shut his mouth. This amelioration continued during several minutes, after when the contractions returned, notwithstanding the passage of the current was suspended awhile, and then reproduced with from 50 to 60 pairs. Amelioration again followed; and these alternations continued during several hours, the salutary effects of the current gradually diminishing, and at last ceasing entirely."—(*Med. Times and Gaz.*)

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"*Migration of the Stump of a Tooth.*—A young lady, sent some months since to M. Delistre by one of his friends, had on the left side of the palate, on a line with the first molar, which was absent at one-third of an inch from the edge of the gums, a loss of substance regularly rounded off, blackish, of the size of a small pea, with regular edges. Several doctors had been consulted, and the affection looked upon by them as caries of the maxillary, had been submitted to different kinds of treatment, all of which had been of no avail. M. Delistre tried to find out by the help of a stylet what affection he had to deal with. This instrument hit on an uneven mass, which gave neither the crepitation of caries nor the rough-

ness of a sequestrum. On pressing heavily all around he thought he felt it moving slightly, and introducing the two very slender points of a pincers for extracting stumps, to his great astonishment he drew out the root of a tooth nearly one-third of an inch in size. This root evidently came from the first molar; it had made its way through the maxillary bone, and had placed itself perpendicularly to the roof of the palate. The patient having been seen a fortnight afterward, was perfectly cured." —(*Bull. de Thérap.* and *Dublin Med. Press.*)

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"*Phosphate of Lime in Periostitis.*—The *Journal de Chimie Médicale* relates two cases of osteitis, attended with intense pain, in which Professor Piorry resorted with much benefit to the exhibition of phosphate of lime. In one patient the tibia and humerus were the seat of a circumscribed tumefaction and severe nocturnal pain. On superficial examination the osseous structures seemed to have preserved their natural consistency, but plessimetric percussion of the affected parts betrayed a loss of elasticity, and an increased sonorousness of the bones. The precedents of the case being of a nature to indicate the presence of the syphilitic taint in the system, the professor prescribed half a grain of protoiodide of mercury night and morning, fifteen grains of iodide of potassium three times a day, and the application of anodyne poultices. This treatment was steadily persevered in for three weeks, but the pain continued with unabated violence, when M. Piorry, taking into account the swollen and softened condition of the bones, conceived that a couple of drachms of phosphate of lime exhibited daily, concomitantly with the iodide of mercury, might possibly prove advantageous. This treatment was therefore instituted, and the issue of the case justified the professor's surmise. In the course of forty-eight hours, the osteocopes had much decreased, and disappeared altogether after an interval of a week. The patient being at the same time an anæmic subject, with a small heart, contracted liver, and a weak pulse, which failed when the arm was kept in a raised attitude, tonics and a generous diet were likewise resorted to.

"The second patient complained of excruciating pains in the left temporal region, which were at first attributed to neuralgia of the fifth pair of nerves, and treated accordingly, but without benefit, by the application of blisters dressed with morphia, and belladonna and opium internally. On closer inspection, M. Piorry discovered on parting the hair, which was very thick, and concealed for a time the true nature of the case, a considerable periostic tumor at the base of the parietal bone. In this instance, also, the plessimeter revealed more sonorousness and less elasticity than on the opposite side of the head. The patient, however, contended, and nothing in her previous history disproved her affirmation, that she had never been affected with any symptom of venereal disease. A drachm of phosphate of lime was exhibited night and morning, and the pains decreased in the course of four days, and in a short time a cure was effected.

"In both these cases, the reader will observe that the plessimeter was used to discover the softening of the bony structures, and that in the patient, whose previous history pointed to syphilis, the use of the calcareous phosphate was in nowise incompatible with the administration of mercurial preparations. We may further add, with the editor of the *Journal de Chimie Médicale*, that the appropriate salt of lime is the

combination obtained by the precipitation by ammonia of a solution of the phosphate in muriatic acid; the deposit should be carefully washed, and preserved in a humid condition."—(*Jour. de Méd. et Chir.* and *Dub. Med. Press.*)

"*Sponge Spicules.*—Dr. Wallich, in a paper on mineral deposit in Rhizopods and Sponges in *Annals of Natural History*, gives a new view of this subject, according to which, when a spicule is to be formed, a vacuole of similar shape makes its appearance in the sarcode, and its long axis is traversed by a thread of sarcode, which he calls a *vacuolar stolon.* The stolon and the walls of the vacuole each secrete a layer of silex, after which the stolon usually diminishes in size, and secretes fresh layers of silex to occupy the vacancy. Layers of silex may, however, in some cases be deposited externally, and to make room for them the walls of the vacuole must recede. The mode of growth he considers different from what takes place in the mineral deposits of rhizopods."—(*Intellectual Observer.*)

"*Terchloride of Carbon.* — Mr. Bryant informs us that at Guy's Hospital the terchloride of carbon has been employed for many years, and that it was a very favorite remedy of the late Mr. Ashton Key, tracing its employment back, therefore, at least fifteen years. As a lotion it has acquired considerable value, and may be looked upon as a stimulant, and in a measure as a disinfectant. In sloughing and fetid ulcers it is of great use. It may be used in the indolent and weak ulcer with general advantage. The usual strength of the lotion is from ♏xx to ʒss of the drug to an ounce of water. It has an agreeable odor and rapid effect. In cases of gangrene, and in sloughing phagedena, it may be employed in its concentrated form with some confidence, a wound thus affected rapidly taking on a more healthy aspect. Upon the whole, it is a very valuable local stimulant, and in Mr. Bryant's estimation ranks above most of the drugs of that class now in use."—(*Med. Times and Gaz.* and *Med. News.*)

"*Preservation of Gum and Starch Paste.*—By John M. Maisch. The paste made by gum tragacanth and gum arabic, which is so extensively used by the apothecaries in this country, acquires, particularly during the warm season, a very unpleasant and even offensive odor in consequence of fermentation, which soon commences on exposure to the air. Oil of cloves, alum, and other essential oils and salts are frequently added to counteract this tendency, with but partial success, the volatile oils merely hiding to a certain degree the offensive odor developed, and retarding the fermentation incompletely. For some time past I have availed myself of the antiseptic property of creosote, which may be added to these pastes recently made, until its odor is faintly apparent. The result is their perfect preservation, no offensive odor being disengaged, and their adhesiveness is not impaired by keeping them for months."—(*Am. Journ. of Pharm.*)

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ORIGINAL COMMUNICATIONS.

PRACTICAL HINTS.

BY J. D. WHITE.

Diagnosis of Toothache.—There are a few more cases of toothache left or circumstances under which it occurs which is worth while to record; and while doing so we wish to say in decided terms that from the various circumstances under which it does arise in the varying pathological conditions of a tooth when once affected by decay, that we never plug a tooth over an exposed pulp if we know it, however slight it may be. Death is sooner or later its common end with more suffering at last, and at times too which may be much more inconvenient, than if killing the nerve had been resorted to at first. Facts tell the true story:—

Case 13.—Mr. M., a gentleman thirty years of age, called, three months since, suffering with slight pain in the left inferior second bicuspid, with increased sensation when cold fluids were taken into the mouth. The tooth had not yet become sore to the touch, nor was the pain continuous. We advised the patient to let the case go if it did not become too severe; it might pass off. We heard no more of it until the morning of the twentieth of April, when the patient presented himself, stating that he had suffered all night, and something must be done for the tooth. We removed the plug, and by slight excavation—as the dentine was softer in the bottom of the cavity than is usual when it is in a normal condition—without touching any nerve; on passing a probe into the cavity, the patient placed his hand to his face and exclaimed, Good heavens! what, what have you done? the pain is awful! It was, perhaps, a minute before he could let us examine the case, and when we did we found the cavity filled with very red blood.

We have observed on many occasions, under similar circumstances, that while a tooth was bleeding it was intensely painful; in a few minutes the pain ceased; we washed the cavity out and applied the arsenical paste,

and proceeded to treat in the usual way. This tooth had been plugged three years, and had been done by a careful operator.

Case 14.—A lady, forty years of age, had been going to a dentist to get her teeth plugged, etc.; but at times suffered great pain along the right side of the face, in the region of the eye and temple; the pain was of an intermittent character, the dentist could not account for it. She sent for her medical adviser; he examined into her case; he prescribed the *valerianate of ammonia*, a dessertspoonful every half hour until relief was obtained. She remarked, Doctor, if I do not get relief, when must I stop taking the medicine? Ah, he replied, take it until you get relief. She persevered until the thirteenth dose was taken, but could take no more; the stomach revolted, but the pain did not leave. She called to see us, but we were laid up with quinsy. We told one of our assistants to take out the plug of the eye tooth, as he said it was slightly sore to the touch. This was done; the pulp was dead. The tooth was treated in the usual way for such case; the pain ceased, and there has been no further pain. This tooth had been plugged at least six years.

These and many more similar cases show that there is no dependence on a nerve when once slightly exposed, or even when decay is in close proximity to it. A plug ought always to be removed when pain sets in under such circumstances. "Vent" in such cases will relieve the suffering, if opening the tooth has not been delayed too long.

Case 15.—A lady, thirty years of age, called to consult us about a wisdom tooth, right side, lower jaw. The tooth was loose; abscess at the root; fistulas opening in the gum. Her medical attendant had lanced the gum; she had been laid up three weeks. Her dentist told her there was no use in taking the plug out, the pain would finally go off, and she would never have any more, as under such circumstances a tooth never ached but once!

(To be continued.)

TREATMENT OF SENSITIVE DENTINE.

BY WM. H. ATKINSON, M.D.

Read before the Brooklyn Dental Association.

HAVING been appointed to prepare a paper "On the Best Means of Treating Sensitive Dentine," I will endeavor to give my best known means and methods.

Such is the variety of original constitution and adventitious condition, that there is probably no one means which could be said to be the best in all cases, short of establishing constitutional and local health, which, if constantly maintained, would prevent the condition from presenting itself at all.

The great mistake here and elsewhere is, the universal desire on the

part of patients and practitioners to effect the desired restoration in too short a time, and with the least expenditure of means; which of itself usually prevents the accomplishment of our purposes in any degree at all worthy of the name of success!

Let us inquire what the condition is that induces sensitive dentine.

The only possible cause of this state is either imperfect original calcification or decalcification to some degree, when the organization (oxidation) had once been well expressed.

Probably there are few cases in which sufficient calcification obtains before complete maturity, to enable us to cut the interglobular space without causing more or less pain. Now, this degree of sensitive dentine may not be deemed pathological. I am not now stating that in the absolute sense this state is not properly below the standard of pure health, only that it does not come within the range of *recognized* disease. You will call to mind that I have repeatedly said that we have as yet no case of perfect health in any tissue other than hair and enamel, and therefore definitions will be more or less ambiguous, as we vacillate between the possible standard and the already attained. The best examples are usually set down as the type of health, while further deflections from the real standard are alone reckoned as diseased states.

However, it is of little practical moment to us whether the entire interglobular spaces of all teeth are in a condition to be painful when cut, for we never need to penetrate them so deeply, unless they are really the subjects of disease and disintegration, requiring reparative manipulations.

It has been an almost universal custom to excavate teeth, no matter how sensitive they may have been, if the pulps were not actually exposed, and fill at the first sitting of the patient, in direct violation of the well-being of the organism, agonizingly beseeching us to spare it the dreadfully debilitating shock. Even in cases where the patient forced himself up to the tension of will necessary to pass the crucifixion, or some hard-hearted parent or guardian of the dear child, whose lacerated ghost will never recover from the rash violence inflicted upon it "for its own good," as the stoic "governor" or stolid operator persistently maintained with demoniac exclusion of the blessed injunction of Him "who spake as never man spake," when He said, "*bear ye one another's burdens!!*" forcing the dear little martyr almost, if not quite, to the verge of distraction.

This detestable class of operators is, thank God, fast dying out; but another but one degree better are holding the sway. I refer to those who either obtund the sensitive dentine for the time or permanently with powerful escharotics, such as chloride of zinc and arsenic, and excavate and fill at the same sitting, and claim this as *successful* arrest of disease, which it seldom is, in the one or the other instance; as our poor afflicted eyes can but too frequently attest!

Let me repeat that which I have often said! There can be no purely

local lesion other than mechanical. Therefore, wherever we find such a state of disintegration as to demand the operation of preparing and filling cavities in the teeth, we may rest well assured that constitutional derangement holds high carnival in that system. And so we may not intelligently look for local means alone to remedy the evil that is more than half dependent upon general derangement of the nutrient forces of the body as a whole, which has found means of strong pronouncement to the dull perception in the *teeth alone!*

Thus we perceive that making the excavation and filling comparatively painless, does not yet meet the indications of a truly redemptive and protective operation.

Another seductive and specious method has been laudingly announced, and if immunity from the sense of suffering were the only end desirable, it would deserve our admiration and sedulous imitation.

I refer to a resort to chloroformization, or administration of other anæsthetics during this dreaded process. In case the only trouble was a crotchety dislike of the patient to the operator, we might look for good and permanent results.

But where all the energies of the system are aberrant we may not hope for the best nor most permanent advantages to flow from such conditions, unless coupled with a proper redemptive dietetic régime.

Therefore you will readily perceive that both local and constitutional means of removing this abnormal state must be resorted to, if we desire and expect to accomplish the most benign and lasting recoveries from the lost conditions of health.

In cases where local derangement alone is persistent, purely local treatment will in the main prove successful in restoring wonted states of soundness. The best present local means of restoration consists in camphorated creosote being freely used during the excavation, and fully saturating the tubules of dentine therewith, after completing the preparation of the cavity before filling, insuring the removal of all else, and then perfect impaction of an impervious gold filling.

The constitutional indications are to correct constipation, laxity or other vice of the system that may be present, before attempting to prepare the cavities for filling by excavation.

During the proper general treatment, a part of which should be to correct acidity by the administration of lime in solution into the system, using lime-water ("aquæ calcis") as a mouth wash also, frequently as four to eight times in twenty-four hours; making free use of precipitated chalk as a dentifrice, leaving the excess between the teeth and *in* the cavities of decay, until this local, combined with the general treatment, shall have subdued the sensitive character of the exposed dentine. After which, prepare and securely fill all the decayed spots, and you and your patient will ever after be mutual helps, and mutual friends.

December 22, 1863.

TREATMENT OF ALVEOLAR ABSCESS.

BY C. P. FITCH, M.D.

Read before the Brooklyn Dental Association.

Mr. President and gentlemen:—Some few months since I read a paper before this body on the Pathology and Causes of Alveolar Abscess. Those who may wish will find that article by consulting the August number of the Dental Cosmos, of 1863. I beg your indulgence, this evening, while I present a few thoughts upon the treatment of this disease. The proper treatment of alveolar abscess must inevitably be determined from a knowledge of its causes and the true nature of its pathology. The former embraces an acquaintance with causes systemic and local, exciting and predisposing. The latter presupposes a knowledge of the nature of inflammation; its stages and their legitimate terminations; the tissues involved, and the character of results or products, whether benign or otherwise.

Without fully understanding the points just enumerated, medicative and local manipulative treatment must be empirical, and partake of the nature of quackery, just in the ratio of the incompleteness of this knowledge; as liable to be wrong as right; as often defeating the very ends desired, if not producing those most to be feared and deprecated.

Incipient alveolar abscess, or that pathological condition or state which may be denominated the irritative, and the congestive, which is the forerunner of abscess, and which is very liable to terminate thus if unmolested, requires very different treatment from that which should be employed where a ripened abscess actually exists.

In all such cases a vigorous attempt should be made to abort or arrest the disease and cut it short in its incipiency; or, in other words, restore the part by resolution.

In the first place, remove the cause of irritation, or suspend the action of the irritant. In the second place, recognize the stage of the inflammation and treat it. Thirdly, medicate the systemic lesion.

Under the first head, which contemplates the removal of that which acts as an irritant, open the tooth fang, evacuate its contents, whether semi-devitalized pulp, pus, or sanies. Syringe with warm water and apply a dressing of creosote to the root canal, carried to the apex of the fang.

Then amputate nervous force; suspend the sensibility of the part. It must ever be remembered that all functional action, voluntary and involuntary, healthy and unhealthy, is maintained and controlled by a force denominated nervous force. This force is liable to great derangement, acting at different times with variable degrees of potency. By lessening or increasing this force, as the case may require, the action of the part

is brought up to a healthy standard. The question very naturally arises, how may this be effected? Answer. Arrest, to a greater or less extent, the functions of the part by congelation, or by paralyzing the periphery of the sentient and sympathetic nerves by a local anæsthetic, thereby suspending the action of the irritant. Congelation may be gradually induced with salt and shaved ice or snow applied to the part in oil silk. Care must be taken, however, to restore the part gradually to normal temperature by holding ice upon it; otherwise the local lesion may be increased by the reaction. I have thus treated numerous cases where alveolar abscess was strongly threatened, with happy results; the part taking on healthy action with the restoration, by granulation and by organization of the fibrin, which is most generally present in this lesion in excess. I was called to see Mrs. A. Found her suffering intensely from an incipient abscess forming about the root of the inferior right cuspidatus. Age about fifty. Nervo-bilous temperament. Found much tumefaction, induration, and redness, pain of a pulsating character. Cleansed the root, making the proper dressings. Congealed the part over the tooth. Pain subsided in a short time; ordered the patient to bed, and an aperient to be given. Found the patient much improved in the morning. Had slept well during the night; subsequently filled the fang and tooth, which remains healthy, giving no further trouble.

A valuable local anæsthetic in the form of a plaster may be made of the following formula:—

℞.—Goulard's cerate, ℥i;
Ext. of aconite, (rad) grs. iv.
M.

It should be placed upon the face over the part threatened with the abscess, during the irritative and congestive stages. It may be employed at any stage of the disease to allay pain. It accomplishes two ends: if timely used, it has a tendency to arrest the disease by paralyzing the peripheral branches of the sympathetic nerve distributed to the capillary vessels, which nerve conveys reflex action, excited by the nerve of sensation, and produces dilatation of the walls of the arterioles of the capillaries. By suspending the action of the sympathetic nerve excited through the sensory nerve by the irritant, the walls of the capillary vessels of the part implicated are contracted, thus assuming their natural status. Their caliber is diminished, thereby forcing into the general venous circulation the accumulated blood; thus the disease is arrested by the part being relieved of its congestion. Another end which it accomplishes, is the suspension of pain, which it most effectually achieves. If much turgescence be present, before resorting to any topical application of either an anæsthetic or stimulative character, apply a leech, or, in the absence of one, scarify the part thoroughly, and promote depletion by holding warm water in the mouth. Recommend a gentle cathartic on retiring

for the night; dismiss the patient with the expectation that marked improvement will be noticeable in the morning. On the other hand, if symptoms are of a more aggravated character, and reasonable suspicions are entertained that pus has already formed, especially if slight fluctuation is perceived, rest assured that the abscess will point upon the gum. Better, under these circumstances, incise at once, and open to the apex of the fang through the alveolus. Syringe with tepid water. If pus is present, dress with a saturated solution of resublimed iodine in creosote. Cover a small splinter of wood, whittled to a point, with cotton; dip the end in the above solution and carry it to the depth of wound, cutting it off just below the surface of the gum. Renew the dressing every day. A few dressings of this kind will generally change the action, producing a healthy exudate. Then dress with a milder remedy, such as iodine in glycerin, vinum opii, sulphate of aluminum, etc. until the fistula is healed. But if the case prove intractable and unyielding, employ proper systemic treatment, which will be spoken of when treating of this branch of the subject. The fang and cavity of decay should be filled as soon as all periosteal inflammation has disappeared.

Where the case is complicated with necrosed bone, remove immediately any portions of the exposed alveolar plate thus affected, with the scalpel or enucleating instrument. But if any portion of the maxilla is thus affected, dress with iodine in creosote, and enucleate from day to day, until the line of demarkation is set up, and the sequestrum detached and removed. Never trust a cure to nature by the slow process of dissolving the diseased bone.

After the removal of all necrosed bone, treatment should be made with direct reference to the reproduction of the lost bony structure. This is eminently attainable—1st, by securing a healthy plasm; and 2d, by retaining and properly protecting it through the stages of fibrillation and calcification. The existing conditions will readily suggest to the erudite, astute operator, the character and potency of the topical remidies necessary to be used.

Systemic Treatment.—In healthy constitutions, treatment of this character may not be required, unless it be some one or more of the bitter tonics to increase digestion and promote nutrition, which may, and often is called for during the prevalence and treatment of the local lesion. In case of previous exposure and present suffering from malarious infections, this course is highly recommended in connection with the exhibition of suitable remedies to excite the functions of the eliminating organs that the poison may be carried out of the system, and the disturbing agent summarily disposed of. But whenever a syphilitic taint is manifestly present, or the predominating symptoms strongly point to this conclusion, exhibit the protiodide of mercury in grain doses until the general system is fully brought under its influence. Employ iron in some form, or the phosphates of iron, calx, soda, potassa, with the appropriate diet.

If scorbutic tendencies prevail, exhibit lime-juice, fresh vegetables, etc. If attended with debility and with feeble functional activities, increase the vital and nutritive acts with proper tonics. Wherever a scrofulous diathesis is present, exhibit iodide of iron, in small doses, until the organism gives unmistakable evidence of its presence. In all these disturbances give a highly nutritious diet. Occasionally act with a mild cathartic, also increase the action of the chylopoetic viscera. Stimulate diuresis if the kidneys are torpid and illy performing their functions. Promote healthy excretion from the surface of the body by diaphoretics, bathing, etc. Recommend suitable exercise in the open air, that the requisite degree of oxidation may be secured, and the blood be properly decarbonized. See that the patient is clothed sufficiently warm, in order that the nutritive acts may be promoted and not defeated. Insist upon good habits, retiring to bed at a proper season. Forbid late suppers, the use of spirituous liquors, tobacco, etc. Attend to these particulars closely, gentlemen, and in the most, if not in every case, marked improvement will be noted.

New York, Feb. 3, 1864.

THOROUGHNESS IN DENTAL OPERATIONS.

BY WM. H. ALLEN.

An Essay read before the Brooklyn Dental Association.

"Whatever is worth doing at all is worth doing well," is a maxim the truth of which, I suppose, will not be questioned.

In whatever branch of science or art a man is engaged, or to whatever field of labor he is called, he does not achieve distinction among his fellows unless his best endeavors are directed to the specialty which he has chosen.

He must be *thorough* in whatever he undertakes, or his accomplishments will be but a tithe of what they might and should be.

He must be *thorough*, first, in his knowledge of the matter which he undertakes, and again in practicing upon that knowledge.

As we look around us upon the various trades, professions, and occupations of life, how few persons do we see who understand or practice them in a really thorough manner! and when we do find a man who is fully "up" to the niceties of his occupation, and devotes his highest faculties to bringing them out, how soon does he acquire a reputation and position which no amount of "puffing" will ever give him!

To be sure, we see men who rise on the tide of fortune with little to recommend them, merely by the strength of an indomitable will and undaunted ambition; but, without the "pure gold" of *solid merit*, their ride will be short, and their fall from an unmerited position disastrous, dragging with them, sometimes, persons of less energy but far more real worth.

To perform any work *well*, a man must be thoroughly imbued with the

necessity of giving thought, as well as time, energy, and labor, to that work, and he who does that, will so bend and shape the knowledge which he obtains from various reading, study, and conversation, as to make it tell upon the particular business or profession to which his mind is especially called.

It is for this reason that I have always advocated the principle that parents, and those who have the guardianship of the young, should study the bent of their minds, and in choosing a profession or trade, assist them in selecting one which shall be congenial, one in which they shall be interested.

The great mass of men are in a false position. The man who should be a general is in the ranks; the man who should be throwing sandbags is, perchance, a general; the man who should be a street-sweeper or wood-chopper is in the pulpit, and might, perhaps, with benefit to his weekly hearers, exchange places with his poor and despised neighbor, whom he refuses to recognize as he meets him on his daily rounds. The man who should be cultivating the soil is behind the counter selling tape, and the one who should take his place is, perhaps, a poor girl, barely obtaining a subsistence by the few pennies she can pick up in the use of her needle, which she is compelled to ply fifteen or eighteen hours a day, in order to keep soul and body together.

I could multiply these illustrations "ad infinitum et ad nauseam," did I deem it necessary; but every one of you will acknowledge the truth of what I have said, as he looks about him and remembers the "botched jobs" which have been performed for him by the—so-called—mechanics of our city. Indeed, we need not go out of our own profession to be made aware of the correctness of this statement, to an extent which should make us blush.

Our patients are not well instructed in the best methods of keeping their teeth and mouths cleansed, and sufficiently impressed with the necessity of frequent examinations by the dentist. Our examinations are not thorough, and many teeth are lost to them in consequence. Cavities are not thoroughly prepared or cleansed before plugging; plugs are not well anchored, and thoroughly condensed and finished. Toothache, that bane of our race, is not properly diagnosed or thoroughly treated. Alveolar abscesses are suffered to drag their slow lengths along for years without even an attempt at treatment, or a hint to the patient that a cure is within the range of possibilities. People are nearly butchered by bungling and abortive attempts at the extraction of teeth and roots, which, by proper treatment, might be saved for years, or, to say the least, might, with suitable instruments and skill, even without the aid of *gas*, be removed from the mouth with very little trouble or pain. Artificial teeth are designed and made without reference to nature or artistic merit, when we have before us constantly thousands of nature's best specimens by

which to be governed. In short, throughout the whole range of our specialty, operations are, in a majority of cases, inartistically conceived and bunglingly executed.

It sometimes seems as though we, as a body, were more imperfect and less thorough than almost any other class of men; but it may be because the imperfections of dental operations are brought more constantly under our eyes, that they seem to be multiplied and magnified.

In the first place, how few dentists go through a proper course of study to enable them to *begin* the practice of a profession which *should* embrace within its range a greater variety of qualification than any other profession with which I am acquainted!

How few of us have thoroughly studied the *anatomy* of the delicate and sensitive living organs which are intrusted to our care, to say nothing of the physiological, pathological, and hygienic knowledge which we should possess, to enable us to properly diagnose and treat the simplest and most common forms of disease connected with the oral cavity!

Are we, as *teachers*, thoroughly impressed with the responsibility of the positions which we have taken upon ourselves, and of the vastness of the effects for good or evil, which are to accrue to the hundreds and thousands who will be operated upon by the pupils under our charge?

Are we, as *pupils*, filled and fired with a determination to make our mark among our fellows in the same department of labor with ourselves, "or perish in the attempt?"

Do we set our mark sufficiently high, or are we too easily satisfied, and so indolent or indifferent as to be happy with only a modicum of the knowledge to which we might easily attain, and consent to be, from the beginning to the end of our career, "*old fogies?*"

How many do we see take upon themselves the responsibilities and cares of a profession for which they have no *aptness*, and with which they have no compatability, their sole object seeming to be to get into a position where they can, as they vainly suppose, fill up their coffers with "filthy lucre," little dreaming *how filthy* it will be if reckoned in a correct ratio to the injury they inflict upon their fellow-mortals, and entirely ignorant of the amount of study and thought, and hard manual labor, absolutely inseparable from the life of a thoroughly capable and honest surgeon dentist!

There is very little thoroughness in the profession. I can hardly remember to have had an assistant in my laboratory during the last twenty years, who habitually made so simple a thing as a *really good* model or cast; not because they did not know how, but because they were not *thorough*, and would omit some part of the process which seemed trifling to them, but which was absolutely necessary to the perfect completion of the object in view.

We notice the same stupid blundering (for in many cases it can be

called nothing else) in all branches of our profession. The best of us are not always free from the charge.

A dentist takes an impression of a mouth for a set, or partial set, of teeth, sends away the patient with directions to call again in a week for the teeth. In a week they are inserted, and present such an appearance as ought to mortify the most impudent, but being pronounced by the dentist "all right, perfect, and beautiful," are paid for and worn away, ever after to be exhibited as a painful attempt to disfigure the "human face divine."

Gentlemen, we have *such* dentists!

Another takes an impression, makes models, casts, plates; tries plate and teeth in the mouth, (and tries the patience of his sitter,) finishes well, and inserts the set, where they *look* well, but cannot be worn. Why? Some simple part of the process of manufacture was omitted, and the whole does not fit. The impression was poor, the model was imperfect, the cast was struck out of shape, or the teeth were, from carelessness, moved from their true position after the last trial, and *all*, from one little fault, has to be done over. How much better to keep constantly in mind the oft quoted motto of one of our countrymen, "Be sure you are right, then go ahead!"

A lady, who had been a patient of mine for some years, called upon me, saying, "My daughter has had her teeth operated upon three weeks ago, and pronounced by the dentist as finished: I am not satisfied, and wish you to see them and do for her whatever is necessary. She will tell you they are all right, but I wish you to be sure of it yourself, and then I shall be satisfied." I examined the teeth and found twelve cavities, nine of which I filled; three were cut out and the teeth polished. This dentist needed the business more than I did, but lost the operation from carelessness or incompetency.

A young lad was brought to me a few weeks since from the country, who said he had three cavities filled two weeks before by a dentist who told him he needed to have two more filled, and then his teeth would be in perfect order. One of the teeth which had been plugged gave him pain, and his parents being dissatisfied brought him to me for my judgment upon the case. The tooth which had ached was filled over an exposed pulp, without treatment, and being so badly decayed, and so much in the way of other teeth which were coming, I deemed it advisable to extract it. I afterward plugged *twenty-one* cavities in the remaining teeth. The tooth which was extracted had two cavities, making in all twenty-three cavities, eighteen of which had been left to decay and destroy the teeth, had not the proper remedy been applied. These were not small cavities, and hard to find; some of them took in twelve or fifteen grains of gold. My predecessor charged three dollars for his operation: my bill was over one hundred dollars, which sum was paid willingly and thankfully.

A dentist, in whose office I chanced to be, called me to see a molar tooth which he had prepared for filling. I examined it at his request, and found the pulp cavity was not properly cleansed. I asked him if he filled teeth in that state, with the dead pulp in? He said, "Oh! I have not quite finished it, but have been into two of the fangs with a broach." I saw the amalgam with which it was to be filled laying on the table before him, ready prepared; and, wondering how much he would be able to do toward perfecting the preparation of the cavity before the amalgam would be unfit to use, bade him good-day and retired.

Would that be considered a thorough operation? Would the money received for that plug be "clean money?"

A lady called upon me to have a front molar and two roots (all she had left) extracted, as a preparatory step toward a new set of teeth. I extracted them. She remarked that she had that molar filled a few months before by one of our best dentists, who charged her eight dollars for an amalgam plug, but that he *filled the roots.*

I saved the tooth, and when I had leisure took out the amalgam, which was about the consistency of hard, dry bread, and could be easily cut with a dull knife. I then with a fine saw opened each fang lengthwise to see how they were filled. I *found* them filled with the remains of the old pulp; not even a trace of our simplest plug of cotton and creosote was visible.

I do not wish you to suppose, gentlemen, that I believe every story brought to me by a dissatisfied patient. I know too well how easily they may make mistakes. I know too well how many good cases of neglect and incompetency could be made out against each of us by ignorant or dissatisfied patients, and my sympathies always lean to the side of my brother dentist; although I may sometimes feel that he should be in some other position.

Do not think, either, that I underrate or undervalue the services of the many faithful and honest men we have in our profession. On the contrary, I recognize and fully appreciate the talent and self-devotion which are displayed by many in our ranks, and feel an honest pride in the thought that I belong to a profession which can do so much to prevent and alleviate human suffering, when I meet with the fruit of their labors.

But, gentlemen, do we not all see, every day, a sufficient lack of thoroughness in dental operations to spur us to renewed thoughtfulness and effort for the accomplishment of more perfect operations in all branches of our art?

Let us then come up to the work with "clean hands and a pure heart," determined that henceforth we will strive with our whole strength to "neither leave undone those things which we ought to do, nor to do those things which we ought to leave undone."

THE USE OF ARSENIC FOR DESTROYING SENSITIVE DENTINE.

BY A. C. HAWES.

It often happens in almost every department of science that new theories will be formed, and experiments tried, which at first seem admirable, and bid fair to come into general favor; but after awhile it is found that they will not stand the test of practical use, or are productive of more evil than good, and they are henceforth dropped and shunned by all well-informed and honest men. It has been pre-eminently so in medicine and surgery. Remedies and modes of treatment which have been at one period highly popular, have been afterward exploded and abandoned, and pronounced to be mere quackery and empiricism. Still it is lamentable to observe that, even where this is the case, there will often be found practitioners who, from various motives, persist in clinging to what is evidently injurious or of doubtful utility, because it is a *convenient* remedy, or answers perhaps a temporary purpose.

Now, this we believe is true, and will soon be generally so acknowledged, as to the employment of arsenious acid for destroying sensitive dentine. It is a convenient article, powerful, quick in operation, and sure to produce very decided results. For devitalizing dental pulps, it is admitted to be preferable to any other agent that has yet been discovered for that purpose. But very many of our profession entertain serious doubts as to the safety of employing it for the "extraction of difficult teeth or roots," as has been advocated by high authority; and especially for its indiscriminate use for the removal of sensitive dentine. For this latter purpose I believe that it is a most dangerous agent, and one likely to produce irreparable injury.

It is the more important to call attention to this remedy, as it is just now meeting with no little favor, from the fact that it is advocated by *some* of our best operators, and indorsed and extensively practiced by a *much larger* number whose position in the dental profession is somewhat *less elevated.* Mere temporary convenience is, however, no rational excuse on the part of an operator for inflicting a permanent injury; nor is it a satisfactory recompense on the part of a patient for suffering one. Both will consult their interests better by looking on to the consequences attending such a practice. Evidence is certainly not wanting to prove, beyond the possibility of a doubt, that *many valuable teeth* have not only been rendered unsightly, but permanently destroyed, in consequence of arsenious acid having been resorted to for the purpose of *facilitating* the *excavation of a cavity*, even where the pulp was far removed from exposure. And the evil will increase, and the "death-blow" be given to a still larger number, if its use be not boldly met and stopped by a careful consideration of the facts of the case.

It has been argued in its favor—and this seems to be regarded as its chief excellence—that it will make the teeth to be operated upon unsusceptible of pain. Now, however *commendable* or *convenient* it may be for the surgeon or the dentist to secure the performance of "Painless Operations," the practice certainly could not be justified while there existed great danger that the subsequent loss of a limb, or of the dental organs, would be the result of such operations. That there is imminent risk of causing the subsequent destruction of the dental pulp, by the employment of arsenious acid for the removal of sensitive dentine, is very clearly proved by the writings of some of the most devoted advocates for its use. Facts that present themselves in the practice of every dental operator must also tend to establish the same opinion.

If "arsenical paste," as is maintained,* may be allowed to remain in superficial cavities with perfect impunity from "six hours" to "ten days," it seems strange indeed that some gentleman, who has a strong desire for the advancement of our profession, and at the same time is willing and anxious to do all in his power to lessen the amount of human suffering, will not elucidate the facts so clearly that all doubts shall be removed, so as to enable every practicing dentist to appreciate and enjoy the privilege of performing "painless operations," and at the same time to feel perfectly justified in his own mind in resorting to so convenient and never-failing a remedy.

Unfortunately the opinions of the profession have greatly differed. The authority of one has been neutralized by the experience of another. No safe rule has been, nor do we believe can be laid down for the use of such a deadly agent. Some profess to employ it quite freely, *except when operating for children;* while others, on the contrary, find it *especially convenient for children's teeth.* Many of its advocates contend that it does not penetrate the tubuli of the dentine, and that consequently there can be no danger of injuring the pulp. At the same time, they assert that the most *minute quantity* applied to a sensitive cavity, and *hermetically sealed,* will destroy *entirely* all sensitiveness of the dentine, even to the most remote portion of the cavity, far beyond the point of application. What mysterious influence should thus induce this subtle agent to extend its happy effects to every portion of a cavity, and that too in a transverse direction to the tubuli, refusing to follow the channels that nature has provided in the solid structure of the tooth?

Let us examine the testimony in regard to its traveling in the direction that would seem most natural, that is, directly toward the dental pulp. It is universally admitted that it must be used with the greatest care, and "watched very closely"—fine chance, by-the-way, for watchers! But why so much care, if there is no danger? If it is safe to allow "arsen-

* DENTAL COSMOS, February, 1862, pp. 382–3.

ical paste" to remain in a cavity for the space of "ten days," might not a young practitioner suppose that he was being *over-cautious*, providing he only permitted it to remain for *three* or *four* days, or a *week?* This would certainly be a very safe inference.

Dr. J. D. White, who has been one of its earliest defenders, if not the first to recommend arsenical paste to the profession for destroying sensitive dentine, says that "*sometimes* the dentine becomes discolored a *reddish hue*, especially when sufficient is applied to *permeate to the pulp*. This," he adds, "will *seldom disappear* unless the pulp be *destroyed* and the tooth left open to *the air and saliva*(?) for some time; but even *under these circumstances* a tooth does not *always recover*, but runs into a *bluish color*." Every dentist knows full well that the "*reddish hue*" means *death to the pulp* and a *blackened tooth*. Dr. White's experience would "*seldom*" allow him to make a mistake in this direction, for, as he very correctly says, in the DENTAL COSMOS of August, 1863, in describing a tooth injured by a blow, "a slightly *reddened condition* in the centre of the tooth was observable: it was sufficient for *us* to be governed by, as we *never knew* a case of the kind *to recover*. In a few days the tooth assumed a *very red appearance* all through the crown, and if it were to remain so, it in itself would be *unsightly*." Here is sufficient comment on the deplorable consequences of an injured or deadened pulp. And we are led to ask, why then deliberately use means which will almost inevitably produce such a result?—a result that we deplore when it comes in the form of an accident, and confess that it is impossible to remedy.

Dr. Ellis very clearly comprehends the great danger to be apprehended, as appears in a recent paper read before the Odontographic Society, in which he says: "When everything else has failed for the removal of sensitive dentine, there are still two reliable remedies—the performance of the operation under the influence of an anæsthetic, or the application of *arsenical paste*. If the *latter plan* is resorted to, the *greatest care* must be exercised lest it *penetrate to the pulp*, and *cause its destruction*."

We fully concur with the opinion of Dr. White, that "to palliate the sensibility of the dentine, is as much a part of the operation to *success*, as preparing the cavity or introducing the gold;" but an operation performed under circumstances that would leave doubts as to the future safety of the operation, evidently could not be considered a "*success*." Again he says: "When we first introduced the practice of palliating tender bone, it was *condemned* by *nearly all*, if not *quite all* in the profession." But he adds: "We believe it to be true, that the *success* we have met with in establishing a large practice has been more from paying a due regard to the *painlessness* of our operations than their *perfection*, which *so many aim at*." How far simple "painlessness" may justify, or compensate for *imperfect work*, we will not undertake to say.

We trust, at any rate, that the *young* practitioner, in his humble sphere, may not be considered *culpable* for "*aiming at perfection.*"

Those who employ "arsenical palliatives" for removing sensitive dentine cannot be aware of the injury they frequently inflict, as they may never see their patient again. An instance of this kind has been brought to my knowledge within a few days, where the dentist who performed a "painless operation" will probably *never suspect* that it was *not* a "*success.*"

Dr. ——, of our city, (whose address can be given if required,) on being applied to by a lady for some operations, was unable to make an appointment under several weeks. Rather than delay, she decided to employ another dentist, who is well known in the community, and has had the advantage of many years experience. He commenced by making an application, *late in the afternoon*, to the first superior bicuspid, with a strict injunction for its removal at *exactly nine o'clock.* As the order was imperative and precise, the clock was anxiously watched, and when the "*mystic hour*" arrived, the mandate was promptly obeyed. But, alas! for all human calculations when dealing with so subtle and potent an agent as the one employed. The "death-blow" had been already imparted. The tooth was filled on the following day, and, as the lady remarked, "was cut and chipped, without the slightest sensation of pain." A few days after the operation, the lady called on the dentist first referred to, and desired to make an appointment, asserting that she should *not return* to the recent operator, as she believed that he had *killed the nerve* in her tooth. Upon examination, a few days ago, it was found that a decided change had taken place in the color of the tooth, it having assumed a "*reddish hue;*" showing unmistakably that it had sustained an injury from which it would "never recover."

For the strongest proof that has yet been recorded of the *penetrating* qualities of arsenious acid, we would refer the reader to the March number of the Dental Cosmos for this year, where Dr. White assures the profession that while he was devitalizing the nerve of the second superior bicuspid, the arsenic was absorbed by the *adjoining* tooth, which had been previously plugged, and inflamed the pulp so as to change the tooth to "*a reddish hue,*" making it necessary to kill and remove the nerve. By what mysterious channel the arsenic reached the pulp of the *adjoining tooth*, the doctor leaves his *wonder-stricken* brethren quite in the dark. The inference he leaves us to draw is, that it must have penetrated the enamel, and thence through the dentine to the nerve—as it could hardly be supposed that it would "permeate" a gold plug!

Let the consequences of the use of this agent for destroying sensitive dentine be thoroughly understood, and even if there be occasional exceptions where injury is escaped, few, either in the profession or out of it, will care to employ it, or allow it to be employed for this purpose. The

number of operations found to be successful in the long run are too few to compensate for the mischief, which is by far the more common result. The frequent cases which present themselves of teeth placed by means of this agent beyond the possibility of relief or entire restoration from our art, should be quite sufficient to condemn it at once.

Prof. Flagg, of the Philadelphia Dental College, in that excellent paper read by him before the American Dental Association, illustrates very clearly that arsenic will destroy more than one hundred thousand times its own weight in animal tissue. It is, therefore, such a concentrated poison, and the amount for any specified purpose so difficult to adjust, so next to impossible to watch and regulate when applied, that every one, it would seem, of ordinary caution and foresight, must dislike, if not refuse altogether to resort to it. So unyielding is it to the most careful and prudent manipulation, that Prof. Morton truly asserts, "it is deaf to all charms, and fatal to any bosom that may harbor it."

New York, 1864.

PROCEEDINGS OF DENTAL SOCIETIES.

PROCEEDINGS OF THE ODONTOGRAPHIC SOCIETY OF PENNSYLVANIA.

REPORTED FOR THE DENTAL COSMOS BY R. J. HOFFNER, D.D.S.

"ANATOMY AND PHYSIOLOGY OF EXPRESSION."

BY J. H. M'QUILLEN, D.D.S.,
PROFESSOR OF ANATOMY, PHYSIOLOGY, AND HYGIENE IN THE PHILADELPHIA DENTAL COLLEGE.

(Continued from p. 501.)

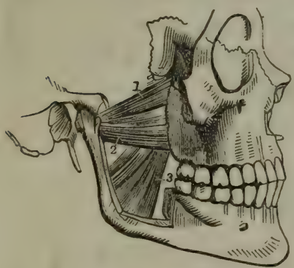
While the muscles already described as the superficial muscles of the face are mainly concerned in the varying expressions of the countenance, it must be remembered that those deep-seated muscles, the temporal, masseter, and external and internal pterygoid, which are the active agents in the comminution of food, sometimes play an important part in expression. This is markedly manifest in the aged after the loss of the dental organs, with whom the shortening of the face, the protrusion of the jaw, and the approximation of the nose and chin, under such circumstances, is due to the contraction of these muscles and the influence which they exert in modifying the shape of the lower jaw, by altering the angle which the *ramus* forms with the body of the bone in early manhood. Considerations such as these indicate the propriety of a brief description of these muscles, in connection with the subject under consideration. The first of these,

The *Temporalis*, arises from the entire temporal fossæ and forms a broad, radiating muscle whose fibres, as they descend, converge into a

flat tendon which is inserted into the inner surface of the coronoid process of the lower jaw. *Function.* It raises the lower jaw.

The *Masseter* is a quadrilateral-shaped muscle, and arises from the malar process of the superior maxillæ and the zygomatic arch, and is inserted into the posterior third of the outer surface of the body of the lower jaw, and the ramus from the coronoid process to the angle. It has two planes of fibres, superficial and deep. The first pass downward and backward, the second downward and forward. *Function.* It draws the lower jaw upward and forward, or upward and backward.

The *Pterygoideus Externus* arises (1) by two heads from the pterygoid ridge of the great ala of the sphenoid bone, the outer surface of the external plate of the pterygoid process, and part of the tuberosity of the palate bone; and its fibres pass horizontally backward and outward, to be inserted (2) into the neck of the condyle of the lower jaw. *Function.* When the two muscles act together they draw the inferior maxillæ directly forward, so as to make the lower front teeth project beyond those of the upper. The protrusion of the chin in those who have lost their teeth is greatly due to this fact. The lateral sliding motion of the lower jaw in mastication is effected by the alternate contraction of the muscles of the right and left sides.



The *Pterygoideus Internus*, (3,) like the masseter, is quadrilateral in form, and arises from the pterygoid fossa of the sphenoid and the tuberosity of the palate bones; its fibres pass outward, downward, and backward, to be inserted into the inner surface of the ramus and angle of the lower jaw. *Function.* It draws the lower jaw upward, and, from the obliquity of its fibres, also assists the pterygoideus externus in carrying the jaw forward and from side to side.

There are other muscles, in addition to those just described, which are somewhat concerned in expression. Among these are the depressors of the lower jaw and the other muscles of the neck, by means of which the head is thrown into various positions, under the influence of the different passions; but it would be foreign to the subject to present even a brief description of them. It is proper, however, to refer to the ocular group of muscles, for the eye is not only one of the most prominent features of the face, but also one of the most expressive. When the rest of the face is so completely under the control of the will that it is impossible to determine what is passing in the mind of another, the eye frequently reveals everything. So true is this that, when the tongue says one thing and the eye another, men of observation and experience invariably believe the latter. It is the position of the organ, whether in the sidelong, upward,

or downward glance; the fixed, prolonged gaze, or the restless, roving motion, that serves as a key, unlocking to the mind of the attentive observer that which another is striving to conceal. The muscles by which these varied movements of the organ are effected are six in number, and consist of two groups, the first of which are four straight muscles, the *Rectus Superior*, *Inferior*, *Externus*, and *Internus;* the second group is formed by two oblique muscles, the *Obliquus Superior* and *Inferior.* In addition to moving the eye upward and downward and from side to side, if all the muscles of either group act together, a retraction of the eyeball is induced by the contraction of the *Recti*, or a protrusion of the ball by similar action on the part of the oblique. Squinting or strabismus, either convergent, looking inward, or divergent, looking outward, which gives such a peculiar expression to the face, is due to a want of harmonious action in the ocular group, and may be caused by overaction or paralysis of a muscle from cerebral disturbance; or it may be the result of imitation. The *Levator Palpebra*, which is included in this group, is the elevator of the eyelid.

The muscles described, like the bony framework on which they rest, would be without motion but for their connection with the brain, through the medium of special nerves, whose function is to give to the various parts of the face that vitality and ever-changing expression which constitutes the charming attraction of the human countenance.

Of the twelve pair of cranial nerves, five pair are concerned in expression, and three of them are distributed to and give motion to the muscles of the eye. Thus the *third pair of nerves*, or the *motor oculi*, sends branches to all of these muscles, with the exception of the motor externus and the obliquus superior, to the first of which pass the *fourth pair*, or *motor externus nerve*, and the second is connected with the *sixth pair*, or *Nervus Pathetici.*

The *fifth* and *seventh pair* of nerves are distributed to the muscles of the face; the latter, also named *portio dura*, or *facial*, emerges from the stylo-mastoid foramen, and then, passing through the parotid gland, is eventually distributed *exclusively* to the superficial muscles in the form of a plexus, named *pes anserinus.* It is purely a motor nerve, upon the integrity of which the expression of the countenance and the varied play of the features depend. This has been demonstrated in the most satisfactory manner by experiments on animals and in pathological conditions in man. Strange as it may appear now, it was formerly supposed that the painful affection named *tic Douleureux* was seated in this nerve, and resection of it at the stylo-mastoid foramen was frequently performed for the relief of patients, but with no other result than inducing paralysis of the superficial muscles and loss of expression on the side of the face operated upon, the patients being unable to close the eyelid, elevate the ala nasi, or move the cheek or that side of the lips, and yet at the same time

still suffering as much from the disease. Paralysis of this nerve is sometimes induced by cerebral disturbance or the presence of a tumor beneath the ear, and is usually denominated Bell's palsy, on account of the true nature of the affection having been made known by Sir Charles Bell, to whose genius and laborious experimental research the world is greatly indebted, not only for their knowledge of this disease, but also for much that is known at present of the nervous system. Paralysis of the *Portio Dura* does not affect in the slightest degree the function of temporal masseter or pterygoid muscles, (and therefore interfere with mastication,) as they derive their nerve force from the *motor branch* of the *fifth pair*. The dependency of these muscles on the motor branch of the fifth can be readily demonstrated by divisions of the nerve on each side in animals, when the lower jaw at once falls, and the subject operated upon is rendered incapable of raising the jaw or masticating its food. If the nerve of one side only is cut, the parallelism of the jaw is destroyed; or, in other words, the muscles of the side operated upon being paralyzed, fail to bring the jaw in contact with the upper, while on the sound side it is effected as usual.

Premising that sufficient has been said with regard to the points already touched upon, we will now pass to the consideration of some of the expressions presented by the countenance when under the influence of the different passions that affect the mind of man. It is impossible to describe all of these; and the attempt, at best, in the consideration of those to which your attention will be directed, must of necessity be merely suggestive to you of an interesting and instructive subject of study, which for years has more or less intuitively engaged my attention: whether when in conversation with others, quietly observing them when engaged in the pursuit of business or pleasure; or watching the delineations of the orator, the actor, the artist; and last, though not least, the truthful revelations of the photograph.

In illustration of this part of the subject, I shall employ a number of drawings, here presented, portraying the different expressions, which are faithful copies of the admirable engravings in Sir Charles Bell's work on the Anatomy and Philosophy of Expression, and to whose eloquent descriptions I not only cordially acknowledge the pleasure derived from their perusal, but also that in the following remarks shall be most happy if I succeed in presenting a fair synopsis of his extended description of the subject in connection with my own observations and thoughts.

All the facial expressions may be classified under two heads—the exhilarating and the depressing; and the angle of the mouth and the inner extremities of the eyebrows as points where a number of muscles concenter are the most movable parts of the face, and on whose changes expression chiefly depend. No better illustration of this fact can be afforded than in the caricature, with which every one is familiar, representing two

faces joined together, in one of which the *elevation* of the angles of the mouth gives a most joyous expression to the face; on reversing or turning the picture upside down, however, depression of the same mouth at the angles produces a correspondingly despondent expression in the other face.

Commencing with *laughter*, you will observe in this picture that the various muscles which have been described as inserted into the *orbicularis oris*, have entirely overcome the action of that muscle whose function is to close the lips. When a ludicrous idea enters the mind, as a general thing it is in vain to try to keep the mouth closed. The antagonistic muscles concentering there exert a force beyond all control, and frequently the more determined the effort not to give way to the inclination, the more marked and explosive eventually becomes the demonstration. The *elevator* muscles, inserted in the upper lip and the angles of the mouth as the active agents in drawing the mouth upward, produce a fullness of the cheeks which, pressing upon the lower eyelids, throws the skin into wrinkles under them. At the same time the teeth are exposed; while by the contraction of the *orbicularis palpebrarum* the eyes are almost concealed, and, by compression of the lachrymal gland, frequently suffused with tears. Together with this, the agitation of the muscles of the throat, neck, chest, and diaphragm produce audible cachinations.

In the reverse of this, or *weeping*, the lips are drawn apart by the converging muscles, but in place of the elevation of the corners of the mouth they are now drawn downward by the *depressor anguli oris;* the nostrils, at the same time, are dilated, and the tears flow profusely from under the convulsively-closed eyelids over the flushed cheeks; while the veins of the forehead are distended and the inner part of the eyebrows are drawn upward and inward by the combined action of the *corrugator supercilii* and the *occipito-frontalis.* The muscles of the throat, chest, and diaphragm are spasmodically affected and the respiration is frequently interrupted by sobs.

Bodily *pain*, the manifestation of which, in the face of our patients, is to us frequently an important means of diagnosis, not only in children, but those of a larger growth, is a condition that particularly claims our attention from a professional and humanitarian point of view. Here let me say, in passing, that pain is by no means what it is usually regarded, an unmixed evil. Paradoxical as the statement may appear, it is frequently a blessing rather than a curse, as it is the chief means by which we become aware that some important organ is diseased. Without such intimation, the part affected might have become disorganized to such an extent as not only to destroy the function of the organ, but also to place even life itself in jeopardy. This applies with peculiar force to those organs which it is our duty to save; for it is the unpleasant sensation of pain which generally drives our patients to us, and it is the various mani-

festations induced by the pain endured which enables the experienced practitioner to determine the nature and extent of the difficulty.

In extreme pain, (except in cases where the patient is suffering from periodontitis, when the occlusion of the jaws intensifies the suffering,) the teeth are brought together with great force and ground against each other by the temporal, masseter, and pterygoid muscles; the saliva frequently flows in large quantities from the mouth, which is drawn open laterally; the face is flushed, the veins distended, the nostrils dilated, the eyebrows raised, the forehead thrown into horizontal wrinkles, the eyelids widely opened, and the tears coursing over the cheeks, betray, in the most unmistakable manner, the suffering endured.

In *fear*, the head sinks backward between the elevated shoulders; the eyes are fixed and staring; the eyebrows are raised to their utmost by the *occipito-frontalis*, which, in addition to a contracted state of the scalp, causes the hair to stand on end; the face is ghastly pale, and the cheeks hollow, shrunken, and in convulsive motion, like lips which are wide open, owing to the dropping of the lower jaw; the breathing is short, labored, and spasmodic.

In *rage*, the inflamed and glaring eyeballs, owing to the contraction of the *oblique* muscles, seem ready to dart from their sockets; the brow is thrown into deep vertical wrinkles by the *corrugators;* the nostrils are dilated; while through the clinched teeth but open mouth words of hate are delivered with emphatic force.

In *joy*, the face is lighted up with a smile by the gentle elevation of the eyebrows, the lively and sparkling appearance of the eye, and the pleasant expression of the mouth, which, without being separated, is drawn aside at the corners.

Conscious of the time already absorbed, and desiring to hear from some of the gentlemen who are present from a distance, we will pass over the consideration of other facial expressions which might be referred to, trusting that those which have been so hurriedly described may awaken a desire on the part of all to acquire a thorough and accurate knowledge of the entire subject, and to make that practical application of the knowledge thus gained of which it is susceptible, but which it does not come within the province of this address to make.

A MONTHLY meeting of the Association was held on Tuesday evening, April 5th.

Dr. C. A. Kingsbury, Vice-President, in the Chair.

The Executive Committee presented the names of Drs. R. J. Hoffner and Wm. A. Breen as candidates for active membership. The ballot being taken, both these gentlemen were declared duly elected.

Dr. Samuel S. White was elected an honorary member.

The essayist for the evening being unprepared, the following lecture, accompanied with varied, interesting, and practical illustrations, by means of a new and improved apparatus, was delivered.

"POLARIZED LIGHT."

BY HENRY MORTON, A.M.,
PROFESSOR OF CHEMISTRY IN THE PHILADELPHIA DENTAL COLLEGE.

Gentlemen:—The apparatus which I shall exhibit to you this evening is one designed by Dr. Charles Cresson, who for many years has given his attention to the improvement of this instrument, and who has succeeded in developing it, from the very rudimentary and inefficient form in which only it has heretofore been employed, into an apparatus whose power and efficiency I shall in a few moments demonstrate to you. This instrument, the *gas microscope and polariscope,* is of incalculable value in connection with collegiate instruction, for the evident reason that it enables us to demonstrate to a large class at once all those delicate delineations and minute distinctions of microscopic structure which must otherwise either be left to the private labor of the student, or be at once imperfectly and painfully exhibited by a long and fatiguing process.

The apparatus before you was constructed by Mr. Joseph Zentmayer, whose name, to those familiar with the microscope, is synonymous with every grace of form and perfection of execution in that instrument; who, in one word, is already acknowledged, in this continent, at least, to be the constructor of not only the most beautiful but the best microscopes in the world. Allow me also to mention here that many of the sections of crystals which I shall presently exhibit to you were prepared for me by this same most skillful constructor, and are the first ever produced on this side of the Atlantic, not, however, for want of effort, as the attempt has often been made to produce these specimens, but never before with success.

In this apparatus the light is obtained from a disk of lime revolved by clock-work before a compound oxyhydrogen jet, in which is burned pure hydrogen directly from a large generator and oxygen from a gas-bag. The light is then collected and condensed by a system of four lenses $4\frac{1}{2}$ inches in diameter, having aggregate foci of 3 inches toward and 15 inches from the light. Convenient adjustments of stage support for object-glasses, etc., are of course added, but need not here be detailed.

I shall this evening confine myself to an exhibition of such specimens as require for their development *polarized light,* and will in the first place briefly explain to you the characteristics of light in this condition.

The term polarized light is unfortunate as a scientific term, because it originated in a false theory, and in no respect suggests the true nature of the phenomena it is intended to indicate; but, on the contrary, by calling up magnetic associations, leads the mind astray, instead of directing it to

the proper road. The name is, however, an established inconvenience, and we must use it as such, bearing in mind that it is only a sign, insignificant in itself, and to be endowed with a foreign and arbitrary value for our use in this particular subject of study.

By polarized light we mean "screened" or "sifted" light, as thus: An ordinary ray of light we conceive to be composed of particles vibrating in every possible plane perpendicular to its direction; a ray of polarized light, to be one whose particles are all vibrating in parallel planes; in other words, a cross-section of the first would be represented by the spokes of a wheel, of the second by the bars of a grating. This, then, in a very rough and general way, is what we mean by polarized light. Next let us see how we can get it, that is to say, how light may be polarized.

There are three ways of polarizing light: by reflection and refraction, by absorption and by double refraction.

1st. Polarization by reflection and refraction. When a ray of light is incident upon a plate of glass at an angle of 57° 45′ it is partly reflected and partly transmitted; both these fractional rays will then be polarized, the reflected one having its vibrations all at right angles to the inclination of the plate, the transmitted or refracted one having its vibrations perpendicular to these. To take a rough illustration: the glass acts like an inclined grating, which passes particles moving parallel to its sloping bars, but throws off those vibrating at right angles.

2d. Certain substances, such as the mineral *tourmaline*, or the chemical substance herepathite, (iodo-sulphate of quinine,) have the power of polarizing light by absorbing and destroying all the rays except those moving in one single plane. They act upon light, in fact, as a simple vertical grating would upon a bundle of flat rulers which we might endeavor to pass through, and which would stop all but those which happened to lie parallel to its bars. Two such "gratings" or crystals *crossed* would stop all the light, but parallel would allow the polarized beam to pass. (This fact was illustrated by experiment with the gas-polariscope.)

3d. Certain substances, the chief of which is the mineral Iceland spar, have the property of dividing a ray of light incident upon their surfaces into two, each of which is polarized in a different plane, the two being mutually perpendicular. Figure 1 represents a crystal of Iceland spar, its form being that of the oblique rhombohedron, having an obtuse solid angle at A and X, and all the other angles acute. The line A X, joining these obtuse angles, is called its principal axis, and in this direction alone no double refraction takes place. A ray of light entering the crystal in any other direction is broken into two; the one more refracted, in this case, obeying the ordinary law of refraction, is called the "ordinary" ray; the one less refracted is named the "extraor-

Fig. 1.

dinary," this last being slightly retarded in its passage through the crystal. If one of these crystals is cut in two in the direction A X, and the two portions are cemented together again with Canada balsam, it will happen that the ordinary ray will be totally reflected on reaching the surface of the balsam, and that the crystal in this condition will transmit a single ray of polarized light, as is shown at the left in Figure 3, where B E is the extraordinary, B O the ordinary ray. By the use of this apparatus, which is called a Nichols' prism, we therefore obtain from a ray of common light (A) having vibrations in all directions, (reducible, however, to two at right angles to each other,) a ray of polarized light, indicated by P, all of whose vibrations are in the same plane.

Let us now study some of the results of these general facts. Suppose that the ray P polarized as above comes upon a thin plate of some doubly refracting substance, say a lamina of mica, (which may be regarded as having openings for the transmission of luminous vibrations in the directions indicated by the crossing lines in F G,) then the polarized ray P will be depolarized or broken up into two waves, Q and R, in the direction of the openings of F G; these waves or rays will not, however, be sensibly separated, because of the thinness of F G, but will come out superposed, one, however, being retarded more than the other. If now these rays meet another Nichols' prism like the first, each of them will be divided into two, S into S′ and S″, T into T′ and T″: S″ and T″ will here evidently be in the same plane, (as also S′ and T′,) and one, say S″, being part of the retarded ray Q, will possess all the conditions necessary for interference of waves and the production of color. This fact you now see demonstrated with the lantern, the brilliant colors thrown on the screen coming from films of mica and of selenite, arranged as indicated in the diagram, their different colors being due to their different thickness. (Various specimens and devices in selenite, as butterflies, flowers, and the like, were here exhibited with beautiful effect, the object at first colorless as thrown upon the screen, acquiring brilliant luminous hues in a moment, as the analyzer or second Nichols' prism was introduced.)

This arrangement just described admits of important application. The power of double refraction possessed by a multitude of bodies, varies in each, and gives us, by reason of this coloring effect, a ready means of discrimination between different substances and various structures otherwise hard to distinguish.

Thus I now place in the lantern specimens of various chemical salts, and though I am using a lens which projects on the screen an image 400 times larger in each direction than the specimen, little can be seen by which to identify each substance; but now I introduce the analyzer, and at once all starts into brilliant and variegated color, with a distinctness of figure sufficient to enable the most hasty observer to distinguish or to recognize. (*Numerous specimens were here exhibited, their dis-*

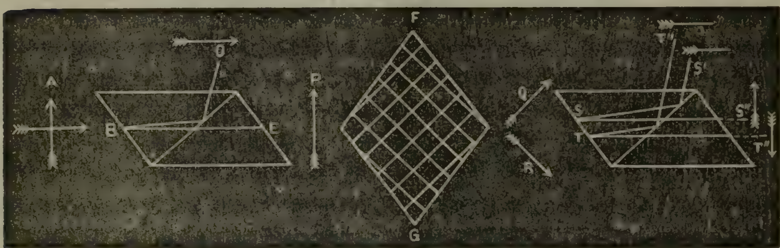
tinguishing characteristics pointed out, and adulterated mixtures by this means analyzed.)

If in the place of the film of selenite of mica, we introduce, in a diverging pencil of light, a plate of some doubly refracting crystal, cut perpendicularly to its principal axis, or axis of no double refraction, a beautiful system of rainbow-colored rings, intersected by a white or black cross, will be projected upon the screen.

Fig. 2.

The formation of these will be readily understood by comparing Fig. 2 (which represents the supposed condition of such a slice as regards the direction in which the luminous waves can pass) with Fig. 3. About the lines A B and C D, the polarized light can pass freely, thus making a white or black cross, according as it is passed or obstructed by the second prism; while in all the intermediate parts, double refraction will break up

Fig. 3.



the rays with production of color, as in the selenite, the variations in angle, however, producing different tints.

At the close of the meeting it was, on motion, resolved to meet on the following Tuesday evening, at which time Prof. Morton designed lecturing upon the solar microscope and its application to the illustration of specimens of bone, teeth, etc.

No other business being in order, the Society adjourned.

An adjourned meeting of the Society was held Tuesday evening, April 12th, when Prof. Morton delivered the following lecture upon the Solar Microscope.

"THE OXYHYDROGEN MICROSCOPE."

Gentlemen:—The difficulty in scientific educational institutions of exhibiting microscopical structures is evident to all who have been in any way connected with such organizations. It is from histological research that the student must acquire that delicate distinction which renders his future judgment of value. The means of illustration most usually em-

ployed—that of exhibiting diagrams—is one which, not unfrequently, conveys to the mind little else than a fanciful representation, conceived in the brain of the painter, and must of necessity be wanting in many of the nicer and finer touches which can only be seen by a self-made examination of the specimen under the microscope.

If the ordinary hand microscope be employed, then the time consumed in viewing the specimens is so great that but few of them can be shown, and, in addition, the student fails to detect important points, because, unaccustomed to the use of the instrument, he is not prepared, even after a description, to render the view of the object perfectly free from confusion.

With the instrument I have before you to-night, the difficulties mentioned are readily overcome, for no matter what number of persons be looking, each has a thoroughly distinct view of the magnified image of the object thrown upon the screen. In addition, the instructor is himself enabled to see the image, and to point out the features of most importance. In this way an infinite number and variety of structures can be shown without tiring the eye of the beholder or wearying his patience, in waiting until thirty or forty have each in turn seen the preparation.

The microscope employed to-night has a magnifying power of seventy diameters, and, to show the facility with which it operates, I will place upon the stage a few microscopic pictures, and proceed afterward to the exhibition of some organic structures.

Prof. Morton then placed within the field a small picture, not larger than the head of a medium-sized pin, and looking like a speck upon the glass slide, when its image was instantly projected upon the screen, and the figures made to stand out in prominent relief. After showing one or two other objects of a similar nature, a number of specimens of bone and tooth structure were satisfactorily displayed. The *lacunæ*, *canaliculi*, and *Haversian canals*, in the bone, were exceedingly well marked, and the dentinal canals, with the intertubular structure, were shown with admirable distinctness. There was no difficulty in distinguishing the primary and secondary curves of the dentinal tubes, with their branches and anastomoses. The enamel fibres were also well shown, and the lacunæ and canaliculi of the cementum made apparent. The sections of teeth comprised both normal and pathological conditions, including the different classes of teeth, various specimens of exostosis, etc.

After the close of the lecture it was, on motion, resolved to extend an invitation to the members of the various Dental Societies and the profession generally, to attend the first annual meeting of the Society, to be held at the Philadelphia Dental College, on the first Tuesday of May, (3d inst.,) 1864, at eight o'clock P.M.

The meeting then adjourned.

PROCEEDINGS OF THE SOCIETY OF DENTAL SURGEONS OF THE CITY OF NEW YORK.

BY J. S. LATIMER, D.D.S.

Dr. R. T. Ambler read a paper, *of which the following is an abstract:—*

I consider the subject of neatness and cleanliness of considerable importance to us and to our patients.

We are striving to make our operations as nearly perfect as possible, and in order to success, must not neglect little things. * * * *

The operating room should be removed, as much as possible, from the noise and confusion of the house. The light should be good, the furniture neat, clean, and rich, if possible. There should be no display of anatomical preparations, skulls, etc., interesting to the dentist, but disgusting to the patient.

The operator should be cleanly in person, neat and tasteful in dress, and pleasing in his manners; in short, a *gentleman.*

Instruments should not be exposed to view unnecessarily. Before inviting a patient to the operating room, we should see that every instrument is in its proper place, and not lying around loose.

The condition of the spittoon must not be forgotten.

The hands should be washed in the presence of the patient, and kept scrupulously clean. The patient should be supplied with a napkin for wiping the mouth, and a larger one should be so placed as to protect the dress. Another should be employed by the dentist in wiping his hands and instruments.

Before introducing a second patient, all the instruments used on patient No. 1 should be washed, and wiped dry, and deposited in their proper places. The cutting instruments should be sharpened. A cup of clean water should be convenient for washing files and burs while using. A small nail-brush is a convenient adjunct for this purpose. Clean files and burs cut very much faster than clogged and dirty ones. Especial pains should be taken with lancets employed in opening abscesses. They may be cleansed with chloride of soda. The same may be said of forceps. These instruments I have found it convenient to have silver-plated, by which they are given a neater appearance, and preserved from rust.

When taking impressions, the dress of the patient should be protected from the plaster and saliva, by a large napkin. The cup should be clean and bright; the wax new, and nice; the plaster clean, and free from lumps.

Thus, with a little pains we will be able to perform clean operations with clean instruments, and get clean money; and avoid hearing such criticisms as,—"I like Dr. ——'s work, but he is not particular enough with his hands, instruments," etc.

Let us in these and in all respects apply the "golden rule" to our operations, and we shall be certain of self-approval, and the appreciation of our patients.

Drs. Fitch and Atkinson heartily indorsed the paper; but thought it well to have a few nicely-prepared anatomical specimens handy, to illustrate to patients sundry ideas which all should understand.

Dr. Clowes said, two years ago he claimed that a tooth with a dead pulp always has a discharge, and with this conviction had not attempted to remove pulps, but the teeth, when he could not save the pulp alive.

Believes an exposed pulp sometimes dies from atrophy.

Believes abscess due to congestion of the pulp. The so-called pyogenic membrane is not a pus secreter, but merely a wall set up to prevent, as much as may be, its action on adjoining tissues.

Dr. Latimer condemned the practice of filling *over* pulps which had been devitalized. A lady recently came to him for treatment, who had suffered occasionally, for more than a year, from facial neuralgia, caused by this malpractice. Spoke of a case in his practice in which a patient, lacking patience, did not persevere in his efforts to get used to an entire artificial denture. He made for him as many as six plates, and two other dentists had tried their skill.

Recently, the patient, an elderly gentleman, came to him, saying he owed him an apology, and some money. He had been using the long-neglected plates for several months, and was pleased with them.

Dr. Fitch said, not many years since the practice of filling teeth having their pulps devitalized, but unremoved from their fangs, was in vogue; and he regretted that this reprehensible practice was still in use, to some extent. But years ago, whenever called upon to fill such teeth, always performed the operation with reluctance, fearing unpleasant sequences. But now thought that ignorance could not be urged as an excuse for malpractice in their loss.

Dr. Atkinson said, probably the most efficient cause why dentistry has made such rapid and sound advancement is the fact of its having no record, and its being free from the incubus of authorities in books or in the minds of men who assume to limit the ability of others.

We are not yet able to say in a given case whether it is safe or the reverse to devitalize the pulp, and fill over it without extirpation. Probably this could be safely done in every case if we knew just how much arsenic would combine with the gelatinous pulp, and could be sure of changing it to the point of the canals into an insoluble arsenicate, which is as good a filling as is possible to insert. I knew an old, careless bungling operator to pursue this practice as a rule, and, strange as it may seem, he succeeded in saving many more teeth thereby than any one else would have dared to hope, without producing alveolar abscess or other mischief.

The destructive power of arsenic is very much modified, if not entirely prevented, if the application thereof is nicely effected, and if surely confined within the dentinal walls; but where it is slovenly applied, and scattered upon the broken margins of gum or alveolar processes, it proves a troublesome customer to keep within due bounds. This I know from a painful, yet happy and timely experience, having once, in destroying the pulp of a left inferior first molar, for a miss of 14 years, had this result to the extent of destroying the transverse process between this and the second bicuspid full one-third of the length of the fangs, which was ultimately reproduced, all but the very thin margins of the inner and outer plates of the processes.

The molar was filled very carefully and slowly, for I had not then acquired my present facility in such cases, into both fangs, pulp chamber, crown, and anterior approximal surface, reproducing the contour of the natural crown.

The operation occupied my assistant (Dr. Charles R. Butler) and myself a whole afternoon of one day and forenoon of the next, and he alone the afternoon of the same, for which I had the hardihood to charge the enormous fee of $17.50. Over two books (two-eighths) of foil were packed into this tooth. The father of the damsel was taken aback at this "exorbitant" demand of mine; but he paid it under my assurance that he would think better of the operation and of me in all future time, which I had the satisfaction of knowing, for 18 months afterward he called and said he owed me a sincere apology for his want of faith and courtesy. And well he might, for I, or rather we, had taken the whole care of the reproduction to complete restoration without further charge, feeling that it would be unjust to charge for surgery that became necessary upon my own want of knowledge or carelessness.

The removal of necrosed bone is as simple as the extraction of a tooth to him who knows what he is about. In fact, all the so-called "great" and "complicated" operations must resolve themselves into simple, clear, and regular steps to the mind of the adept in such matters, to bring them within the pale of certainty of result.

Dr. Latimer said he had lately tried a method of applying alkali, recommended to him by Dr. A. C. Hawes.

He placed some dry bicarbonate of soda in the sensitive cavity and sealed it with gutta-percha. He had that day excavated a cavity without causing pain, which a week before was exceedingly sensitive, and which had been treated in the method described.

Dr. Atkinson, in reply to Dr. George E. Hawes, said that the saturated solution of iodine in creosote would reduce the sensibility of dentine if frequently applied. He had known dentine to remain sensitive, after the cavity had been stopped with gold, for two years.

Dr. Cassel had employed lime-water for reducing sensibility in dentine,

and liked it well. Practically, however, it was defective, from the fact that the result depended on the faithfulness of the patient.

Dr. Fitch believed that acid produced sensitiveness of dentine. Alkaline conditions of the general system may produce an acid reaction in the oral fluids. When the acrid agent is removed, and the cavity well filled, the sensitiveness will soon disappear, unless the alkaline condition of the general system continue.

Dr. Fitch remarked that in rotating a tooth upon its axis there were two physiological acts involved, viz., solution and reconstruction, or, in other terms, the taking down of old and the building up of new tissue. Supposed pressure, in such instances, produced disintegration by interfering with the nutritive act of the part. Also entertained the idea that the structural portions disintegrated were taken up into the circulation, and did not remain in a granular pulpy mass about the fangs.

In the application of force for moving a tooth, should graduate its degree, and thus regulate the rapidity of change by the superinduced congestion and pain, which would involve, to some extent, general and local disturbance.

After moving such teeth to the point desired, held them *in situ* by employing small platinum wire, applied to them and the adjoining teeth in the form of a figure of 8.

Dr. Atkinson, in reply to Dr. A. C. Hawes, said the spiculæ of the cancellous transverse process became softened by solution of the lime, (which caused its hardness and stiffness,) rendering the tooth loose and readily movable in any direction.

The danger of rotating single fanged teeth is much enhanced where the ends abruptly turn from the normal axial line.

The rotation tends to press with undue force the apex against one side of the wall of the alveolus, strangulating the vessels of the pulp at its apicial constriction, causing inflammation and death if persisted in.

Pressure impedes the circulation through the parts pressed upon, which favors deoxidation or partial disintegration, the degree to which it is pushed marking the advantage or disadvantage of the process. If the fixtures are removed too soon, the tooth or teeth have a strong tendency to return very rapidly to their former position; so it is well to wait long enough to be sure of solid recalcification before pronouncing the case a success, and dismissing it from close and frequent inspection.

Solution and recalcification take place in probably two ways, viz., the lime salts are sometimes simply broken down by solution, and, without removal from the site, recalcify, rendering the bone harder than normal primal formations of this tissue; and in other instances where the absorbent system is very active, the solution is removed, and new plasm is wept out into the bony matrix or chasm, and this passes the degrees of oxidation or organization, more in accordance with the original steps of—1st,

mucus; 2d, cartilage; 3d, bone; by infiltration of the fresh lime salts of the general circulation, which also makes a more distinctly differentiated or harder bone than the primal calcification.

Nerve, bone, and tendon are common examples of reproduction. Now, however much inveighed against, muscle, "true skin," gland, and brain have not been found capable of reproduction. But I have the audacity to hope that all tissues will yet become the subjects of reproduction at will.

At least one man of education, skill, and (*brute*) force adopts the heroic in regulating teeth, by seizing them and forcing them to the desired position, retaining them there by the proper fixtures; and it is said he succeeds.

I prefer a more gentle, although slower, process of bringing divergent teeth into regular line. Have a case now under treatment some six weeks, and am not half through the process of spreading and adjustment. Have informed parents that two or more years will be consumed before the case can be dismissed with assurance that the teeth will remain in the new position and arrangement. Have had to keep in the sustaining apparatus more than three years, in at least one case, which in the end proved very satisfactory, and brought me the high remuneration of intelligent acknowledgment by her father, who was an erudite surgeon.

Dr. Fitch, as chairman of a committee appointed to investigate the case of death from inhalation of nitrous oxide, read the following copy of the testimony of Dr. George B. Bouton, before the Coroner:—

"Geo. B. Bouton, M.D., being sworn, deposes and says: I have made an examination of the body of the deceased, Samuel P. Sears, at 274 West 22d Street. Autopsy commenced at 12 o'clock M., Jan. 12th, 1864, in presence of Dr. Dana, and others. Body that of a medium sized man; moderately well developed, and nourished; pupils dilated; countenance of a dusky hue. Both lungs were bound down by old pleuritic adhesions, of an exceedingly firm character; the right much less than the left, which was about three-quarters covered. The only portion of lung tissue which seemed to be available for the purpose of oxygenation, was the lower half of the right; all the rest was so thickly studded with tuberculous depositions, with patches of hepatization and vomicæ, as to seem comparatively useless—there being six cavities in the left lung, averaging in size a half fluid ounce each. One at the extreme apex; one part of its walls being formed by the pleura. One on its anterior aspect just below; the others in the substance of the lower lobe. There was also a mass in this lobe of almost cartilaginous consistency, of the bulk of about three ounces, made up apparently of tuberculous depositions, and fibrinous formation. All available portions of the lungs were intensely congested; a portion of the apex of the right was free from blood, its tissue being so changed as not to admit of engorgment with

blood, or permeation by air. There was no well-marked vital change in any of the other organs examined.

"The nearest approximation observed was with the right kidney, in the pelvis of which a trace of pus was noticed. The cause of death was congestion of the lungs: and I believe that the congestion was induced by the use of nitrous oxide gas. GEO. B. BOUTON, M.D.

"Taken Jan. 12th, 1864.
JOHN MILDEY, *Coroner*.

"S. W. Dana, M.D., being sworn, deposes and says: I was present at the autopsy of deceased, made by Dr. Bouton, and entirely concur in the testimony and opinion that he has given in regard to it.

"S. W. DANA, M.D.

"Taken Jan. 12th, 1864.
JOHN MILDEY, *Coroner*."

In conclusion, Dr. Fitch made some remarks on the nature and action of the gas, and advised investigation of its influence on the organism, by competent parties. Referred to the fact that dilatation of the pupil is one of the best guides in judging of the influence of agents on the nerve centres.

Dr. Atkinson believed the fatal effect in Mr. Sears' case was due mainly to the carbonic acid, which, being exhaled into the bag, was taken back into the lungs at the next inhalation, and produced its toxical effect.

Dr. Franklin had inhaled from the same batch of gas from which Mr. Sears partook, and found it sweet and pure.

Dr. Latimer places little confidence in popular reports of death from agents. The nitrous oxide had been administered for many years without our getting report of serious results; and, later, it had been administered in a great many thousand cases with the happiest effect; but now, because a person with only a half of one lung left to him had died from pulmonary congestion, the affrighted public are attacked with an epidemic, and they fall like autumn leaves before the gaseous blast. He had not changed his favorable opinion of the gas as a substitute for ether and chloroform in the removal of teeth and dental pulps; but he urged no one to take the gas.

Prof. Vanderweyde said persons with small lungs have frequent pulse, because the circulation is necessarily rapid in order to aerate the blood sufficiently. The gas, by its stimulating effects, increases the circulation with great rapidity, and may thus produce pulmonary congestion.

He recommended watching the pulse, and if the pulsations numbered 100 per minute on presentation, he would not administer the gas. Should the pulsations during inhalation be increased to 100, he would cease the administration. He finds by tests that the inhaled nitrous oxide, de-

prived of its carbonic acid, is pure; showing that the gas is absorbed as a compound, and needs not to be decomposed in order to produce its stimulating effects.

Dr. Fitch raised the question, how shall an operator treat the patients of another dentist seeking information as to the true condition of his teeth? Thought that an honest statement should be made concerning their present condition, provided that the inquiry was made in good faith. But he would be very careful not to make invidious allusions to the capability of a fellow-practitioner. He would never compromise another with a design or desire of his own elevation. This he should regard as despicable. He saw a great difference between an honest statement of facts and remarks reflecting upon the dentist at the time the operations were performed. He was not particular to inquire the name of the dentist under such circumstances.

Dr. Hayes, of Buffalo, said he commenced dentistry many years ago, when educational advantages were few. He had been compelled to grope his way up the rugged steep. When he thinks of the mighty strides dentistry has made within his remembrance, he is proud of the profession of his choice, and buoyant with hope for the future.

He would that he could be rejuvenated, and commence anew with the advantages now held out to beginners.

Dr. Lahoche presented a patient, a gentleman of 24 years, the crowns of whose first inferior temporary molars were held in position by overarching, adjoining permanent teeth.

Dr. Geo. E. Hawes presented for inspection the apex of the tusk of an elephant, imbedded in which was an iron musket ball.

IOWA STATE DENTAL SOCIETY.

The proceedings of this Society did not arrive in time for publication in the March number of the Dental Cosmos, and their appearance in the February number of *The Register* seemed to make their publication in *detail* less important. An abstract should have been inserted in the April number, but it was crowded out by a press of matter. In preparing reports for publication in the magazines, of the transactions of the numerous Societies which, it is gratifying to observe, are being formed all over the country, it would be much better if the reporters would merely present the pith of the remarks on the subject discussed, and particularly to refer, if at all, in the briefest manner possible to business matters; for, however important this may be to those in attendance at the meetings, it is very uninteresting to the mass of readers, who always object to the publication of such matter.

The second meeting of the Iowa State Dental Society took place at Iowa City, January 20th, 1864, pursuant to call.

The Society was called to order by Dr. Kulp, of Muscatine; and, upon

his nomination, Dr. N. H. Tulloss, of Iowa City, was elected President *pro tem.* by acclamation.

A discussion on the following subjects was participated in by the members.

1st. *Best mode and materials for filling teeth.*—Dr. Kulp preferred gold, in all cases where it could be used, and when patients were able and willing to pay for it. Felt very partial to sponge or crystal gold; could always build out broken teeth to their original size and shape with it. Thought that a good amalgam filling was much better than a poor gold filling.

Dr. Robinson, of Davenport, preferred gold in all cases where it could be used; when it cannot, employs amalgam.

Dr. Kulp said, where there was danger of getting the filling wet, either by the bleeding of the gums or from mucus contained around the necks of teeth, he found that by applying a little perchloride of iron, and forcing a pledget of cotton upon the margin of the gum, there was no further trouble; and could use sponge gold with perfect success.

Dr. Harris, of Rock Island, Illinois, always recommended gold for filling teeth; used crystal and S. S. White's soft foils generally; did not use much crystal gold; thought it was not entirely free from acid; perhaps the present manufacture was purer than when he tried it.

Drs. Smith, Myers, and Coulson corroborated the above statements.

2d. *Treatment of diseased teeth.*—Dr. Robinson, of Davenport, used, for destroying exposed pulps, creosote and arsenic; left in generally twenty-four hours; removed pulp and nerve as nearly as possible, and put in cotton saturated with creosote and tannin, and directed patient to return in three or four days, when he filled the tooth. Cured about three out of five teeth with diseased periosteum, employing creosote and tannin generally.

Dr. Kulp did not fill the tooth for about ten days after removing the nerve. Was always sure of saving teeth with diseased periosteum when he could force creosote through the tooth and out through fistulous opening of the abscess; saved about half of such teeth; found the greatest difficulty with inferior bicuspids.

Dr. Harris said he did not leave creosote and arsenic in the tooth longer than from six to eight hours.

Dr. Kulp gave a history of a severe case of alveolar abscess from a diseased central incisor; his manner of treating it with iodine, perchloride of iron, tannin, and creosote, bringing it to a healthy state, and filling it with gold—since perfectly well.

SECOND DAY.

After the transaction of other business, on motion, proceeded to elect officers for the ensuing term, which resulted in the following choice:—

President.—Dr. N. H. Tulloss, of Iowa City.

Vice-President.—Dr. Wm. H. Robinson, Davenport.

Secretary and Treasurer.—Dr. A. J. McGarvey, DeWitt.

Corresponding Secretary.—Dr. Wm. O. Kulp, of Muscatine.

Resumed regular subject for discussion.

3d. *Deciduous teeth, irregularities, and best mode of regulating teeth.* —Dr. Robinson thought that deciduous teeth were generally prematurely extracted. We could not be too cautious in conclusions as to whether such should be taken out or not; it depended a great deal on the ingenuity of the dentist.

Dr. Newell, of Leclaire, thought the great majority of cases of irregularities were caused by premature extraction of teeth. The mode to regulate was to remedy this fault.

Dr. Myers, Davenport, has extracted a great many deciduous teeth, but only when in his opinion it was necessary.

Dr. Harris thought that there were, no doubt, other causes as potent in producing irregularities of teeth, but he would most emphatically condemn the wholesale extraction of deciduous teeth. The subject is not impressed on the minds of parents sufficiently by the dentist.

Dr. Kulp thought, as a general thing, neither parents nor dentists consider the relative value of deciduous teeth as they should. He related a case in his practice of a little girl ten years old, with cuspidatus and first bicuspids of lower jaw entirely outside of the arch, a plain case of premature extraction of deciduous teeth.

4th. *Mechanical dentistry; vulcanite work.*—Dr. Robinson, of Davenport, used the rubber extensively; liked it better than any other style of work. Did not use air-chambers in full sets, and seldom in partial sets.

Dr. Myers, of Davenport, said he had used the "Vulcanite" for eighteen months, and condemned its general use for several reasons.

Dr. Harris, of Rock Island, said he differed somewhat with Dr. M. on the rubber question. He deemed it far superior to silver in all cases, and in many cases to gold.

Dr. Newell, of Leclaire, preferred rubber as a base for artificial teeth to everything else except gold, and in some cases would not except that. In partial sets, used gold generally; discarded the use of air-chambers in partial as well as full sets.

Dr. Kulp used rubber extensively; thought its introduction in the dental profession one of the greatest blessings of the age to the people. Dentists are generally apt to lose sight of the fact, that the object of our profession is to do good to the human family; thus anything which will benefit the people should be highly prized by the dentist.

After which, Dr. Harris, of Rock Island, presented several beautiful specimens of work gotten up by him, after the style of what is known as "Dr. Fuller's Combination Vulcanite Work." Dr. H.'s testimony is, that he has seen no objections to it, having used it in his practice for some time.

Dr. Robinson said he admired the style of work, and hoped, if it proved practicable and permanent, it would be used by all.

AFTERNOON SESSION.

By a unanimous vote, Davenport was selected as the place, and the second Tuesday in August, at eight P.M., as the time for holding the next meeting.

The following resolution was offered by Dr. Robinson, which was adopted:—

Resolved, That the dissemination of general dental knowledge would elevate the profession and benefit the public, and to gain this object the Society do hold public meetings at the usual times for regular meetings; and that one or more public lectures on some subject in dentistry be delivered at such meetings; and that three members be appointed a committee to carry this resolution into effect.

Committee appointed, Drs. Robinson, Kulp, and Chase.

On motion, proceedings of this session of Society were ordered to be published in DENTAL COSMOS and *Dental Register of the West.*

Adjourned until the second Tuesday in August next.

AMERICAN DENTAL ASSOCIATION.

THE American Dental Association will hold its Fourth Annual Meeting at Niagara Falls, on Tuesday, July 26, 1864, at 10 o'clock A.M.

It is hoped that every member and delegate will manifest an active interest by being present at this meeting.

C. R. BUTLER, Cleveland, Ohio, *Corresponding Secretary.*

AMERICAN DENTAL CONVENTION.

THE Tenth Annual Session will be held at Detroit, Michigan, commencing Tuesday, August 2d, 1864.

ORDER OF BUSINESS.

1. Reading the Constitution, and Admission of Members.
2. Reading the Minutes of last Convention.
3. Reports of Officers and Standing Committees.
4. Election of Officers.
5. Retiring President's Address.
6. Induction of Officers.
7. Reports of Special Committees.
8. Miscellaneous Business.

ORDER OF DISCUSSION.

1. The best means of improving the practice and elevating the profession of Dentistry.
2. Anæsthetics—their proper use and relative value.

3. Extracting teeth: when it should be done and when not,—the best instruments for the purpose, and the subsequent treatment, when any is required.

4. Absorption of alveolar process—causes and treatment.

5. Filling teeth: The relative value of different materials, and the mode of operating in difficult cases.

6. The best mode of obtaining accurate impressions and models of the mouth.

7. The relative value of different materials as a base for artificial teeth.

8. Miscellaneous.

All written communications must be read to open the discussion of the subjects to which they relate, and must not occupy more than fifteen minutes in the reading.

No member shall speak more than ten minutes at one time, nor more than twice on the same subject, without the unanimous consent of the Convention.

The subjects selected for discussion are unusually practical, and are designed to elicit the results of actual experience and observation, rather than theories and speculations, which are better for the seclusion of the study than for public assemblies.

All Dentists in regular practice may become members of the Convention, and all such are hereby invited to attend.

L. W. Rogers, Utica, N. Y.,
A. W. Kingsley, Elizabeth, N. J.,
J. A. Watling, Ypsilanti, Mich.,
A. Hill, Norwalk, Conn.,
H. A. Smith, Cincinnati, Ohio,
} *Executive Committee.*

DENTAL ORGANIZATION.

The following notice of an effort to form a Society in the interior of the State of Pennsylvania has been received, and is published with the view of giving it a wider circulation than it could otherwise secure:—

"The undersigned practicing dentists, fully recognizing the benefits of united effort and social intercourse, cordially invite you to meet us in Convention to be held at Danville, Pa., on Wednesday, May 4th, 1864, for the purpose of forming a permanent dental organization, and taking measures to elevate and advance our profession. Yours, etc.

"J. D. Wingate, Bellefonte; H. H. Martin, Jersey Shore; M. D. L. Dodson, Williamsport; H. Gerhart, John Locke, Lewisburg; J. L. Andrews, Milton; G. B. Brown, E. C. Kester, Danville; H. C. Hower, Geo. Rishel, Bloomsburg; W. A. Chittenden, Scranton; Williams & Allen, Pittston; C. S. Beck, M.D., E. D. Williams, J. M. Barrett, Wilkesbarre.

"April 5th, 1864."

EDITORIAL.

"FILIGREE WORK."

We have no objection to any one trying his best to elevate the operations on the mouth to the highest point of excellence. That should be the aim of all engaged in our noble calling; but how shall this be accomplished? One will say, by expending the longest possible time on every piece of work, and using the best, or at least the most costly material. This incurs—and it is perfectly right—a large expense, much greater than a large number of patients can afford. Now on this point we have no fault to find. Some operators say we make everything as perfect as it is possible, no matter how humble the patient is, or how limited his means. This is all proper and right, if the patient beforehand is a party to the bargain; but to say that whoever employs us has no business to complain of our prices, if they see proper to select us to operate, is not true, unless it is fairly understood beforehand. If operators put up their prices to exclude four out of five who require their services, an operator who chooses, or can afford to serve the remaining four, should not be treated indifferently by others, or be considered as lowering the profession. While our operations are necessary, they are not involving life and death. Still there is a vast share of humanity demanded of us in our operations, by a suffering community. Men who place their services out of the reach of a large portion of the community, do not like to be regarded as wanting in humanity. There is no humanity in an operator rendering his services, if an exorbitant fee is demanded as an equivalent. Such men ought to rejoice that there are others who can afford to serve such patients, so as to give them full opportunity to enjoy their large fees. We have nothing to complain of, except that men attempt to coerce patients into larger fees than their services are worth, compared to other things. Some such we know do very mean and inferior work. We do not believe in "fee bills" in the profession. No bill can elevate an inferior operator to the standard of an experienced, and educated one. Nor can any inferior operator lower an operator of high merit, no matter how low his fees may be, or if he operates for nothing. We advocate the doctrine that every one should stand on his own merits, and as he is appreciated by a discriminating public. It was remarked to us a few days since, that a certain operator said he could get as much as he could do, and at whatever price he chose to ask. At the same time we had just been told by others, that they considered his charges a system of robbery. This brings odium upon our profession; and doubtless it originated from the fact that the dentist would not condescend to let his patients know beforehand what his charges were to be. We cannot operate for a large number of patients who call upon us: we cannot afford it.

We send such patients to younger operators. Older operators have a right to higher pay than younger ones. Every young man must make a practice somehow; and he had better occupy his time to gain experience and excellence, if he is not paid half the equivalent of his work, until he gets his time filled; besides, he requires the work to educate his skill. It is worth more than he gets for his work. A man who offers inferior work to the community for the sake of getting work to do, degrades himself and the profession. But do not look down upon a young man who is honestly and quietly attending to his business, to improve himself, and to benefit his fellow-men. An operator does not lower the profession who does work as well as it can be done for such price as his patient can afford to pay; and for a dentist to make—as our heading implies—filigree work for any one, rich or poor, is very foolish. Substantial work should be made by all, or that should be their aim; but do not run too far over the bounds of utility, and call it excellent, and condemn every one who does not square up to it. We saw a tooth a few days since, that had been filled a year ago with amalgam. It gave great pain, and finally terminated in abscess. It was filled at a charge of *five dollars*, but the dentist said that if he had done it right with gold, it would cost *twenty-five.* The patient could not pay so much, and hence it was filled with the amalgam. The patient suffered, and the tooth was ruined. Is this elevating the profession?

J. D. W.

OF THE DISPOSITION MADE OF COMMUNICATIONS WITH REFERENCE TO IMPROVEMENTS MADE BY THE AUTHORS.

In the March number of the *Dental Register*, there appeared an article with the above caption, by B. Wood, M.D., in which the writer endeavors to make out a case against the publisher of this journal, based on the fact that a communication from him, giving "Directions for using the Plastic Metallic Filling," had been declined. The following letter, quoted in part by Dr. Wood, will explain the reasons therefor:—

"PHILADA., *Sept.* 30, 1863.

"DR. B. WOOD, *Albany, N. Y.*

"DEAR SIR:

"Your communication came duly to hand, and was submitted to Dr. J. D. White.

"He thought that it belonged properly to the advertising pages, but was willing that it should go in if I thought that it ought to be admitted. I therefore kept it upon my desk for a few days to give it due consideration. I have now arrived at the same conclusion, these being some of the thoughts that have influenced me:—

"First. It will be necessary to print instructions for the use of those who purchase the filling, but who do not take the DENTAL COSMOS, and if published for them, it is not necessary to publish them for those who do take

it, as the instructions should accompany the material, and would be more convenient to the operator than if in a book.

"For the same reasons I think it is not best to send the stereotype cuts of the instruments to be inserted as a communication.

"There are many communications received in reference to improvements made by the authors which are important to the profession, but which are usually declined as communications when they are offered for sale to the profession. This rule applies to myself as well as to other parties. SAMUEL S. WHITE."

In reviewing the above letter, Dr. Wood proceeds to argue the duties of Journals to writers and readers, and arrives at the following conclusion:—

"But the announcement of any information important to the profession is doubtless due a place once, as a communication, whether it benefits the person making it or not. After that, if the writer, or any one else, desires to keep it before the profession for his own or another's benefit, or other purposes, he might properly be referred to the advertising sheet; since one statement of the same information is all he can ask, and all that a journal promises to give, unless it be for elucidation of new matter."

That Dr. Wood has no just cause of complaint, judged by his own standard, will appear from the following exhibit:—

An article was copied from the *Chemical News*, in the Periscope of the DENTAL COSMOS for May, 1861, page 579, entitled "Wood's Fusible Metal."

In the same department of the DENTAL COSMOS for Feb., 1862, page 401, copied from the *Franklin Institute Journal*, Dr. Wood's own language is given, occupying more than two pages.

In the Review department of the DENTAL COSMOS for Jan., 1863, page 326, Dr. McQuillen copied from the *Dental Register* an article by Prof. Taft highly eulogistic of Dr. Wood's invention; and at page 328, same number, an unfavorable report of a trial of it, taken from the *American Dental Review*.

In the way of communications direct from himself relating to the material under discussion, there was published in the DENTAL COSMOS, September, 1862, page 59, "Plastic Metallic Filling for Carious Teeth;" Feb., 1863, p. 353, "Materials for Filling Teeth," (read before the Brooklyn Dental Association.) These two articles made thirteen pages, which were not only published, but for which Dr. Wood was paid as a contributor.

In the article alluded to in the DENTAL COSMOS, page 63, Sept., 1862, Dr. Wood says:—

"I intended to have offered some directions as to the mode of using this material, but my communication is already too long, and I propose to furnish the dental depots with samples and directions." And in the last

article published in the Dental Cosmos for Feb., 1863, page 360, speaking of the "Plastic Metallic Filling," he says, "It is presumed the profession have by this time become acquainted with it."

We thought so too, and therefore declined respectfully to publish "Directions" for its use, with cuts of the instruments recommended.

Since then, in the November number of the Dental Cosmos, 1863, page 220, Dr. McQuillen gave a favorable opinion of the article, in extreme cases, from his own pen.

In the April number, 1864, Dr. J. D. White has pronounced an unfavorable opinion.

Satisfied with the efforts to render justice to Dr. Wood and to the profession, we are content to leave the subject with this explanation, adding only, with reference to the remark made by Dr. Wood, "A publisher having a third of his journal set apart expressly for advertising what he has for sale," etc., that this is in accordance with the usual custom, and besides is no injustice to subscribers, as the number of pages of reading matter has in each volume been larger than was promised in the prospectus.

Samuel S. White, *Publisher.*

REVIEW OF DENTAL LITERATURE AND ART.

BY J. H. M'QUILLEN, D.D.S.,
PROFESSOR OF ANATOMY, PHYSIOLOGY, AND HYGIENE IN THE PHILADELPHIA DENTAL COLLEGE.

The Fifth Annual Meeting of the American Dental Association.—The fifth annual meeting of the American Dental Association will be held at Niagara Falls on the last Tuesday of July, 1864. As by the constitution of the Association none but those who are exclusively engaged in the practice of dentistry are eligible to membership, "holding their appointment either as delegates from local institutions or as permanent members," it is important, therefore, that the various local Dental Societies throughout the country, which have not already done so, should elect delegates to that body at the earliest period possible, so as to secure the right of representation. Each institution is entitled to one representative for every five active members. To prevent confusion, each delegate should be supplied with a certificate of election, signed by the proper officers of the society which he represents, as this will be demanded by the *Committee of Arrangements;* and no one can be permitted to take part in the deliberations of the Association without such voucher of his right to do so. This is not required by the Association in a spirit of exclusiveness, but with the view of promoting the formation of additional State, County, and local societies, through which, as legitimate channels, as many desirable members may be secured as possible. It is a source of congratulation that, since the establishment of this Association, the num-

ber of local societies have increased in the most gratifying and encouraging manner, particularly within the past year, seven new societies having been organized in that brief period. Although only a short time now remains before the meeting of the American Dental Association, it is to be hoped that the profession in some of the large cities, and in sections of the country still without local societies, will move promptly, and effect the organization of additional societies and elect representatives to the National Association.

Recognizing, as the Association does, *that all sound practice is founded on correct theory, it by no means ignores the so-called practical subjects, but, on the contrary, has ever in view the practical application of such theories as may from time to time be brought forward at the meetings.* In addition to this, through the medium of special committees, every advantage is afforded and every inducement held out for the presentation to the Association of improvements in operative and mechanical dentistry, whether emanating from those holding membership with the Association or not. Those who have anything of value in these directions are therefore cordially invited to come forward with their improvements.

The appropriation of certain hours each day, either before or after the meetings, to operations on the teeth, would be a new feature, and no doubt prove as attractive and instructive as it is eminently practical in its character. Beyond a doubt there are many good operators scattered over the country, who have different modes of operating, and from each of which something can be learned at a grand clinic like this, where every opportunity would be afforded for acquiring practical information of the most desirable and valuable character. Some disadvantages, of course, must attend operations performed under such trying circumstances as operating out of one's office, and removed from the ordinary conveniences; but these must be expected, and preparations should be made to remedy them.

The present indications place it beyond a question of doubt that the meeting of the Association at Niagara will be largely attended by practitioners from all quarters; and it is trusted that it may prove advantageous to those in attendance, and its transactions redound to the credit of the profession.

THE READER—LONDON, FEBRUARY 27, 1864.

"PROFESSOR HUXLEY'S LECTURES ON 'THE STRUCTURE AND CLASSIFICATION OF THE MAMMALIA,' AT THE ROYAL COLLEGE OF SURGEONS.—The seventh lecture, delivered on the 16th of February, was devoted to an account of the modifications which the human body undergoes in its development from the earliest period up to maturity. The principal point of general interest was the description of the changes of proportion which occur in the different parts of the frame during the process of growth.

These were shown by diagrams copied from the work of Liharzik, (whose beautiful series of models, fully illustrating this subject, some of our readers may recollect to have seen in the Austrian department of the International Exhibition,) and may be summed up as follows: The entire length of the adult has increased on an average to three and a half times the length of the new-born infant. The head increases at a comparatively small rate, having in the adult only twice the size it has in the infant. The proportion of the arms to that of the other parts remains constant, the rule that the distance from tip to tip of the outstretched fingers equals the height being good for all ages. The legs, which in infancy and childhood are very short as compared with the body, increase greatly as growth continues; for, while the arms of the adult are but three and a half times the length of those of the infant, the legs have increased to five times the length they had at birth. Thus, while the body and the arms continue to grow proportionately with each other, they are lifted up, as it were, by the more rapid lengthening of the lower limbs, and the head gradually decreases in proportion to the size of the other parts.

"In the eighth lecture, on February 18th, Professor Huxley commenced a sketch of the principal variations in form and proportion which are met with in the human body under the different circumstances which have given rise to the various races of men. This interesting and fertile subject, he observed, has unfortunately been cultivated hitherto to a very small extent, and with very little of the precision which its importance demands. From the best series of measurements of skeletons of the two races extant, that made by Dr. Humphry, it appears that the average height of the negro is less than that of the European; the arms are proportionately longer, particularly the forearm and hand, and, in the lower extremity, while the femur retains nearly the same relative length as in the European, the tibia and foot are considerably increased. In these deviations from the European standard, the Australian and other low races agree with the negro. There is no real evidence to show that the hallux, or great toe, is differently constructed, or more movable, among the lower than the higher races of men, though in the latter the practice of wearing tight and hard shoes rarely allows its proper development. The alleged uniformly greater flatness of foot, and increased length of heel of the negro, are equally hypothetical. The modifications of the color of the skin in different races are well known; we speak of white or black people, but in reality they are various shades of brown, darker or lighter; a true black skin, according to Professor Huxley's observations, scarcely exists. In the character as well as the color of the hair, men vary much. The transverse section of the hair of certain races is flattened, in others it is oval, and, again, in others it is nearly circular. It has been asserted, but not on sufficient evidence, that the first form is characteristic of the negro, the second of the Aryan, and the third of the Mongolian races. In some hair of the first form, the long axis of the diameter gradually changes its position in the length of the hair, causing a crisp curl, or spiral twist. * * * * * *

"In the ninth lecture, on February 20th, Professor Huxley continued the description of the principal variations of the human structure. It was first shown that the position of the occipital foramen, and of the condyles by which the skull rests upon the first vertebræ of the neck, varies greatly both in individuals and races; but, as a general rule, they are placed further back in the lower than the higher races. The different

planes in the interior of the skull, such as the tentorial, ethmoid, etc., are also liable to variation, and so, particularly, is the plane of the *squama occipitis*, which slopes sometimes backward and sometimes forward from the superior curved line on the occiput, in accordance with the greater or less magnitude of the posterior lobe of the brain.

"The development of the face and jaws, in proportion to that of the cranium, varies greatly in different races of men. This can only be estimated accurately upon skulls which have been vertically bisected. It will then be seen that two causes may operate in producing a prominent jaw: 1. The actual size of the bones, constituting the condition called 'macrognathism.' 2. The enlargement of the cranio-facial angle, by which the face undergoes a kind of upward and forward rotation on the skull, producing 'prognathism.' The jugal arch differs very greatly in strength and lateral projection; in some cases it can be seen projecting beyond the sides of the cranium, when the skull is held at arm's length with the vertex toward the observer; such skulls Mr. Busk proposes to call 'phænozygous.' In well-formed European skulls the chin is straight, or projects slightly beyond the level of the incisor teeth; it is less prominent in the lower races, but never to any marked extent. The arch formed by the teeth in the European and short-headed races is wide and evenly rounded; in some of the lower forms it becomes prolonged and narrow, the sides being nearly parallel. In these also the posterior molars are not so disproportionately smaller than the others, as in the higher groups. * * *

"The important question now remains—What is the value of the differences which have been shown to exist in the structure of human beings? This question resolves itself into two others. 1. Are these differences sufficient to justify us in supposing them to indicate distinct species of men? 2. Can any of the deviations be considered as transitional toward the lower forms of animals? In respect to the first, it is certain that well-defined types occur in different geographical localities, so distinct that any zoologist, taking a single example of each, without any other evidence, would probably pronounce them to be distinct species; but the fact that every intermediate form can be found between the most typical, and the absence of any proof of their infertility *inter se*, conclusively show that there is no sufficient ground for the doctrine of the diversity of species among men. As to the second question, it can be answered equally positively. Although in the lower races of men now upon earth, and in the skeleton found in the cavern in the Neanderthal, the human characters vary a little in some particulars in a pithecoid direction, the extent of this variation is very slight indeed when compared with the whole difference which separates them; and it may be safely affirmed that there is at present no evidence of any transitional form or intermediate link between man and the next succeeding form in the vertebrate scale.

"I hold in my hand an address to a scientific body of this country, which has recently been published,* and has, I doubt not, been read by many as an authoritative expression of the results of scientific investigation: and you shall judge for yourselves whether it does or does not merit the stigma of public condemnation, which I think it my duty to take this opportunity of affixing to it. * * * * *

"Again, we are told, 'the inferior molars sometimes present in the

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* These remarks refer to a paper entitled "The Negro's Place in Nature," by James Hunt, Ph.D., President of the Anthropological Society of London.

negro race five tubercles; and this anomaly is sporadically found in other races. It has been noticed in the European and the Esquimaux, but is affirmed by my friend, Mr. Carter Blake, to be more frequent in the negro and Australian than any other race.'

"Truly this is a notable discovery. We shall hear next that the scapula and the femur are 'more frequent in the negro and Australian than any other race.' In my previous lecture, when speaking of the dentition of man, I demonstrated to you the elementary fact, of which, up to this time, I did not imagine the merest tyro could be ignorant, that the lower molars of man are always typically five tubercled; the hindermost alone, from its imperfect development, occasionally breaking the rule. A normal human lower jaw, with the first and second molar devoid of five tubercles, would be a rare and interesting anomaly.

"And this is put before the unsuspecting public, without comment or qualification, as the verdict of science touching 'The Negro's Place in Nature!'"

—

The Reader—March 5.

"The Dentition of the Negro.—The last number of *The Reader* contains a report of Professor Huxley's eighth and ninth lectures on 'The Structure and Classification of the Mammalia,' in which my own opinions and those of my friends are misrepresented in a manner which, on one material point at least, calls for explanation on my part.

"The scientific world may judge between the allegations of Huxley, and the evidence of such observers as have not thought it beneath them to examine carefully a large series of human skulls. * * * * I shall proceed in the first place to cite the testimony of Professor Owen on this point. That author says:—'[In the human species] the crown of the inferior true molars are quinquecuspid, the fifth cusp being posterior and connected with the second outer cusp; *it is occasionally obsolete in the second molar.* The *four normal cusps* are defined by a crucial impression, the posterior branch of which bifurcates to include the fifth cusp; this bifurcation being most marked in the last molar where the fifth cusp is most developed,' (Owen, 'Odontography,' 4to., London, 1840–45, p. 454.) A later version of the above is given in the most painstaking work which has appeared on the subject as yet in England; we are therein told:—'In the lower jaw, the human molar is quinquecuspid, the fifth tubercle being developed posteriorly, and connected with the postero-external cusp. *The fifth cusp is, however, frequently absent in the second tooth of the series,* and is most developed in the *dentes sapientiæ.* A crucial depression separates and defines the four principal cusps, and by a bifurcation of its posterior branch includes the fifth. This bifurcation is most apparent in the third molar,' (Webb, 'Teeth in Man and the Anthropoid Apes,' 8vo., London, 1860, p. 33.) '[In the gorilla and chimpanzee] the fifth cusp is present in the second tooth; *it is usually absent in the second molar of man,*' (*ib.* p. 34.) '[In the Caffre.] In one cranium we observed an indication of the *fifth or posterior tubercle in the second molar of the lower jaw.* This, *which is not the typical configuration in man, is nevertheless occasionally to be met with, and it does not appear to be limited to any particular race.* We have seen it well marked in modern European skulls, in negroes, in a cranium of a Greenlander, in a Chinese, and also in an ancient Egyptian, and in a Romano-Briton. It is sometimes to be found in the penultimate lower molar of one side only,' (Webb, *loc. cit.*, p. 41.) '[In the Bosjesman.]

In the lower jaw, the third molars were, as usual, smaller than the penultimate; and in the latter there was no indication of the fifth or posterior tubercle, *in this respect agreeing with the typical conformation*,' (Webb, *loc. cit.*, p. 40.) It will now be seen what those 'elementary facts' are, of which the 'merest tyro' should not be ignorant, and with which it appears that Professor Huxley is unacquainted. The lower molars of man are five-tubercled in such savage races as the negro and Australian, which certainly exhibit this generalized character of the genus *Homo* in a marked degree; but in the higher races there is a tendency, *especially in the second molar*, to exhibit a cruciform arrangement which, by suppression of the fifth and posterior cusp, divides the tooth virtually into a quadricuspid molar.

"Seven examples of, so far as regards the quadricuspid *second* molar, the 'rare and interesting anomaly' which Professor Huxley desiderates, lie on the table before me as I write. In one 'ancient British' mandible there is not the slightest trace of a fifth or posterior tubercle in either *the first or second* molar of the lower jaw.

"In a large number of English lower jaws which I have also examined, although the first molar is, in the vast majority of cases, quinquecuspid, the quadricuspid form of the second molar predominates in five-sixths of the skulls.

"How many similar instances exist in public collections, Professor Huxley may inquire; seven crucial instances, coupled with the testimony of the above observers, are sufficient to demonstrate the insufficiency of the rash induction which Professor Huxley, undaunted by the difficulties which appal the 'merest tyro,' has ventured to make.

"Further criticism of this unparalleled lecture shall be offered by me on another occasion. C. CARTER BLAKE.

"4 ST. MARTIN'S PLACE, W.C., March 1, 1864."

"Dr. Hunt writes (giving Mr. C. Carter Blake as his authority) that 'the inferior molars sometimes present in the negro race five tubercles, and this anomaly is sporadically found in other races.' My comment upon this was, that the attempted distinction is fallacious, because, as all anatomists know, the lower molars, whether of white or of black men, are normally five tubercled.

"By way of refuting me, Mr. Blake is good enough to produce strong corroborative evidence of the truth of this statement from two distinct authorities, Professor Owen and Mr. Webb; both of whom agree in affirming the human lower molars to be five tubercled, or 'quinquecuspid,' though they differ respecting the frequency of the aberration of the second lower molar from the normal standard.

"My own observations have led me, I may say, to agree rather with Professor Owen (as quoted by Mr. Blake) than with Mr. Webb; but however this may be, it is clear that the normal and regular occurrence of five tubercles in the other two molars of Europeans is not doubted by anybody, and therefore that the 'discovery' assigned by Dr. Hunt to Mr. Blake has the precise value which I attached to it.

"Finally, in reply to my assertion that 'a normal human lower jaw, with the *first* and *second* lower molars devoid of five tubercles, would be a rare and interesting anomaly,' Mr. Blake informs us that 'seven examples of a quadricuspid *second* lower molar lie before him.'

"What if there were seventy instead of seven? Aware that it is not uncommon for single molars to vary, I met the anticipated quibble half

way by demanding a case in which the *first and second* should alike deviate from the normal standard. Mr. Blake suppresses the half of my conditions, and then pretends to have fulfilled them by seven examples! If the ancient British skull, to which Mr. Blake refers, is really a case in point, the fact that that gentleman's anxious search has only been able to bring one such specimen to light proves that it is exactly what I have termed it—'a rare and interesting anomaly.'

"I am, sir, your obedient servant,

"THOMAS H. HUXLEY."

The above extracts are presented on account of the assertions made by Mr. Carter Blake, relative to the marked difference existing between the dentition of the negro and other races. Desiring to ascertain the *truth* with regard to these statements, I made—through the courtesy of Prof. J. Aitken Meigs—a careful examination of the valuable collection of Human Crania of all *races*—numbering 1035—deposited in the Academy of Natural Sciences of Philadelphia, by the late Dr. Samuel George Morton, well known by his contributions to ethnology, and found, as a rule, so far as those specimens are evidence, that the *inferior second molars are quadricuspid*, or present four tubercles in *all the races; occasional* though rare exceptions to this are sometimes presented, in which they are quinquecuspid, but *not more frequent in one race than another*. The first and third molars of course are invariably quinquecuspid. I found the same fact to hold good on examining 40 very fine skulls, recently imported from France by Dr. S. S. White; also, in my own private collection, numbering 20 perfect crania, and embracing different races. Lastly, in company with the Post Surgeon of Camp William Penn, an encampment of negro soldiers in the neighborhood of the City of Philadelphia, I examined the teeth of a number of the negro soldiers, and found further confirmation of the statement already made; and proving that the inference of Mr. Blake, that the *second molars of the negro* are more frequently quinquecuspid, or presenting five tubercles, than other races, has no foundation in fact. Comment on this is unnecessary; the facts speak for themselves. It may not be amiss, however, to say that it is always advisable, before making sweeping scientific generalizations, to be sure that the facts are sufficiently numerous and reliable, to give a sure foundation that will support the superstructure.

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ATLANTIC MONTHLY—APRIL.

OUR PROGRESSIVE INDEPENDENCE.—The following extract, from an interesting and instructive article by Prof. Holmes, is presented on account of the terse and straightforward manner in which the facts are advanced. And to no profession, art, or trade do they apply with more significance than to dentistry, for in this country, by the establishment of associations, magazines, and colleges, our specialty was first raised from a mere handicraft and elevated to the grade of a liberal profession, and many who have left our shores for foreign lands, not only occupy high and honorable

positions, but also enjoy world-wide reputations. Neither must it be lost sight of that the great boon to suffering humanity, anæsthesia, was first practically demonstrated by the lamented and ill-fated Horace Wells, whose rightful claim to priority of discovery, however much it may have been ignored in the past, will yet receive that credit from the world which is his due, and as a practitioner of our specialty is the due of the dental profession.

"We have seen that our cautious parent had taken good care not to let her American children learn the use of her tools any farther or faster than she thought good for them—and herself. They no sooner got their hands free than they set them at work on various new contrivances. One of the first was the nail-cutting machinery, which has been in use ever since. All our old houses—the old gambrel-roofed Cambridge mansions, for instance—are built with wrought nails, no doubt every one of them imported from England. Many persons do not know the fact that the screw-auger is another native American invention, having been first manufactured for sale at Lancaster, Pennsylvania, in 1776, or a little earlier. Eli Whitney contrived the cotton gin in 1792, and some years later the machinery for the manufacture of fire-arms, involving the principle of absolute uniformity in the pattern of each part, so that any injured or missing portion of a gun may be instantly supplied without special fitting.

"We claim to have done our full share in the way of industrial inventions since we have become a nation. The four elements have all accepted the American as their master. The great harvests of the earth are gathered by his mowing and reaping machines. The flame that is creeping from its lair to spring at the roofs of the crowded city is betrayed to its watchful guardians by the American telegraphic fire-alarm, and the conflagration that reddens the firmament is subdued by the inundation that flows upon it from an American steam fire-engine. In the realm of air, the Frenchman who sent a bubble of silk to the clouds must divide his honors with the American who emptied the clouds themselves of their electric fires. Water, the mightiest of all, which devours the earth and quenches the fire, and rides over the air in vaporous exhalations, has been the chosen field of ingenious labor for our people. The great American invention of *ice*—perhaps there is a certain approach to its own coolness in calling it an invention, though Sancho, it may be remembered, considered sleep in that light,—this remarkable invention of ice, as a tropical commodity, could have sprung only from a republican and revolutionary brain. The steamboat has been claimed for various inventors, for one so far back as 1543; but somehow or other it happened, as it has so often happened, that 'the chasm from mere attempts to positive achievement was first bridged by an American.' Our wave-splitting clippers have changed the whole model of sailing-vessels. One of them, which was to have been taken in tow by the steam vessels of the Crimean squadron, spread her wings, and sailed proudly by them all. Our iron water-beetles would send any of the old butterfly three-deckers to the bottom, as quickly as one of these would sink a Roman trireme.

"The Yankee whittling a shingle with his jack-knife is commonly accepted as a caricature, but it is an unconscious symbolization of the plastic instinct which rises step by step to the clothes-pin, the apple-

parer, the mowing-machine, the wooden truss-bridge, the clipper-ship, the carved figure-head, the Cleopatra of the World's Exhibition.

"One American invention, or discovery, has gone far toward paying back all that the new continent owes to the old civilizations. The cradle of artificial *anæsthesia*—man's independence of the tyranny of pain—must be looked for at the side of the Cradle of Liberty. Never was a greater surprise than the announcement of this miraculous revelation to the world. One evening in October, 1846, a professional brother called upon the writer of this paper. He shut the door carefully, and looked nervously around him. Then he spoke, and told of the wondrous results of the experiment which had just been made in the operating-room. 'In one fortnight's time,' he said, 'all Europe will be ablaze with this discovery.' He then produced and read a paper that he had just drawn up for a learned society of which we were both members, the first paper ever written on this subject. On that day not a surgeon in the world, out of a little New England circle, made any profession of knowing how to render a patient quickly, completely, pleasantly, safely insensible to pain for a limited period. In a few weeks every surgeon in the world knew how to do it, and the atmosphere of the planet smelt strong of sulphuric ether. The discovery started from the Massachusetts General Hospital, just as definitely as the cholera started from Jessore, to travel round the globe.

"The advance of our civilization is still more strongly marked by the number and excellence of musical instruments, especially pianos, which are made in this country. It would hardly be an exaggeration to say that the piano keeps pace with the plow as our population advances. More striking evidence than even this is found in the fact that the highest grade of the highest instruments used for scientific research is produced by our artisans. One of the two largest telescope-lenses in the world is that made by Mr. Clark, of Cambridge, whose reputation is not confined to our own country. The microscopes of Mr. Spencer, which threw those of the continent into the shade at once, and challenged competition with the work of the three great London opticians, were made in a half-cleared district of Central New York, where, in our pilgrimages to that Mecca of microscopists, Canastota, we found the shrine we sought in the midst of the charred stumps of the primeval forest. While Mr. Quekett was quoting Andrew Ross, the most famous of the three opticians referred to, as calling '135° the largest angular pencil that can be passed through a microscopic object-glass,' Mr. Spencer was actually making twelfths with an angle of more than 170°. Those who remember the manner in which the record of his extraordinary success was deliberately omitted from the second edition of a work which records the minutest contrivance of any English amateur,—the first edition having already mentioned the 'young artist living in the backwoods,' will recognize in it something of the old style in which the mother country used to treat the colonies.

"It may be fairly claimed that the alert and inventive spirit of the American has lightened the cumbrous awkwardness of Old World implements, has simplified their traditional complexity, has systematized methods of manufacture, and has shown a certain audacity in its innovations which might be expected from a community where every mechanic is a voter, and a maker of lawgivers, if not of laws. We are deficient principally in patience of detail, and the skill which springs from minute subdivision of labor and from hereditary training. All this will come by

and by,—all the sooner if our ports are closed by foreign war. No natural incapacity prevents us from making as good broadcloth, as fine linen, as rich silks, as pure porcelain, as the Old World can send us."

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People's Dental Journal.—In the April number of this journal, the editorial corps has been increased by the addition of Prof Jos. Richardson, of Terre Haute, and Dr. Hill, of Norwalk, whose professional standing, and literary labors and capacities, are too well known to demand any other indorsement than the simple fact of mentioning their names.

PERISCOPE OF MEDICAL AND GENERAL SCIENCE IN THEIR RELATIONS TO DENTISTRY.

BY GEO. J. ZIEGLER, M.D.

Force.—"The old view of the forces, which regarded them as material entities, may now be regarded as abandoned. Light, Heat, Electricity, Magnetism, etc., which have hitherto been considered under the self-contradictory designation of 'Imponderable Elements,' or immaterial matter, are now, by common consent, beginning to be ranked as pure forces; having passed through their material stage, they are regarded as kindred and convertible forms of motion in matter itself. The old notions, that light consisted of moving corpuscles, and that heat, electricity, and magnetism were produced by the agency of various fluids, have done good service in times past; but their office was only provisional, and, having served to advance the philosophy of forces beyond themselves, they must now take rank among the outgrown and effete theories which belong to the infantile period of science. This change, as will be seen, involves the fundamental conceptions of science, and is nothing less than the substitution of dynamical for material ideas in dealing with the phenomena of Nature.

"The new views, of which Professor Tyndall is one of the ablest expositors, are expressed by the terms 'Conservation, and Correlation of Forces.' The first term implies that force is indestructible, that an impulse of power can no more be annihilated than a particle of matter, and that the total amount of energy in the universe remains forever the same. This principle has been well characterized by Faraday as 'the highest law in physical science which our faculties permit us to perceive.' The phrase 'Correlation of Forces,' is employed rather to express their mutual convertibility, or change from one to the other. Thus, heat excites electricity, and, through that force, magnetism, chemical action, and light. Or, if we start with magnetism, this may give rise to electricity, and this again to heat, chemical action, and light. Or we can begin with chemical action, and obtain the same train of effects.

"It has long been known that machines do not create force, but only communicate, distribute, and apply that which has been imparted to them, and also that a definite amount of fuel corresponds to a definite amount of work performed by the steam-engine. This means simply that a fixed quantity of the chemical force of combustion gives rise to a corresponding quantity of heat, and this again to a determinate amount of mechani-

cal effect. Now, this principle of equivalency is found to govern the transmutations of all forms of energy. The doctrine of the conservation and correlation of forces has been illustrated in various ways, but nothing has so powerfully contributed to its establishment as the investigation of the relations of heat to mechanical force. Percussion and friction produce heat. A cold bullet, struck upon an anvil by a cold sledge-hammer, is heated. Iron plates, ground against each other by water-power, have yielded a large and constant supply of heat for warming the air of a factory in winter; while water inclosed in a box, which was made to revolve rapidly, rose to the boiling-point. What now is the source of heat in these cases? The old caloric hypothesis utterly fails to explain it; for to suppose that there is an indefinite and inexhaustible store of latent heat in the rubbing iron plates is purely gratuitous. It is now established, that the heat of collision and of friction depends, not upon the nature of the bodies in motion, but upon the force spent in producing it.

"When a moving body is stopped, its force is not annihilated, but simply takes another form. When the sledge-hammer strikes the leaden bullet and comes to rest, the mechanical force is not destroyed, but is simply converted into heat; and if all the heat produced could be collected, it would be exactly sufficient, when reconverted into mechanical force, to raise the hammer again to the height from which it fell. So, when bodies are rubbed together, their surface-particles are brought into collision, mechanical force is destroyed, and heat appears,—the heat of friction. The conversion of heat into mechanical motion, and of that motion back again into heat, may be familiarly illustrated in the case of a railway-train. The heat generated by combustion in the locomotive is converted into motion of the cars. But when it is desired to stop the train, what is to be done? Its mechanical force cannot be annihilated; it can only be transmuted; and so the brakes are applied, and the train brought to rest by reconverting its motion into heat, as is manifested by the smoke and sparks produced by the friction. Now, as heat produces mechanical motion, and mechanical motion heat, they must clearly have some common quality. The dynamical theory asserts, that, as they are both modes of motion, they must be mutually and easily convertible. When a moving mass is checked or stopped, its force is not annihilated, but the gross, palpable motion is infinitely subdivided and communicated to the atoms of the body, producing increased vibrations, which appear as heat. Heat is thus inferred to be, not a material fluid, but a motion among the ultimate atoms of matter.

"The acceptance of this view led to the highly important inquiry, What is the equivalent relation between mechanical force and heat? or, how much heat is produced by a definite quantity of mechanical force? To Dr. Joule, of Manchester, England, is due the honor of having answered this question, and experimentally established the numerical relation. He demonstrated that a one-pound weight, falling through seven hundred and seventy-two feet and then arrested, produces sufficient heat to raise one pound of water one degree. Hence this is known as the mechanical equivalent of heat, or 'Joule's Law.'

"The establishment of the principle of correlation between mechanical force and heat constitutes one of the most important events in the progress of science. It teaches us that the movements we see around us are not spontaneous or independent occurrences, but links in the eternal chain of forces,—that, when bodies are put in motion, it is at the expense of

some previously existing energy, and that, when they come to rest, their force is not destroyed, but lives on in other forms. Every motion we see has its thermal value; and when it ceases, its equivalent of heat is an invariable result. When a cannon-ball strikes the side of an iron-plated ship, a flash of light shows that collision has converted the motion of the ball into intense heat; or when we jump from the table to the floor, the temperature of the body is slightly raised,—the degree of heat produced in both cases being ascertainable by the application of Joule's law."—(*Atlantic Monthly.*)

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Teeth.—Dr. Lionel S. Beale thus treats of these organs in one of his lectures on "the Anatomy of the Elementary Tissues of Man," at King's College, London.—"Although I am unable to give a clear or complete account of the changes occurring during the formation of a tooth, I shall have no difficulty in convincing you that the study of these dentinal tissues is of the utmost interest and importance, not only to those who are to devote themselves specially to dental practice, but to every student of physiology and medicine.

"We shall necessarily be led to discuss most important questions connected with Formation, Nutrition, and Growth, and the anatomy of the tooth structures is of special interest to me, because the changes I shall describe receive, I think, a most satisfactory explanation upon the new views I have propounded in this course of lectures.

"You will find that, as in the case of bone, many authors, in describing the anatomy of tooth structure, have described, not the living growing tissue, but dead and dried texture. In dentine, tubes or canals containing air have resulted from the drying up of the soft matter which occupied them during life, and to these artificial channels the office of transmitting nutrient fluid to every part of the tissue has been assigned, but upon most insufficient grounds.

"*The dentinal tissues not disintegrated and renovated.*—These dentinal tissues of all the textures in the body are those which undergo the least amount of change, and the statement that the material of which our teeth is composed is being continually removed and renewed, is a mere assertion, and utterly unsupported by facts or by sound argument.

"It has often been asserted that *all tissues* in the organism undergo constant change during life; but this statement is only in part true. Nevertheless, observers have, one after the other, received it in its widest signification, and, accepting the dictum as true, have allowed inferences derived from actual observation to be modified by it. Thus it has been asserted that both bone and teeth have a system of tubes through which *new particles* are carried to all parts of the structure to replace the *old ones* which are removed by the same channels. But I will assert the very contrary, and I am sure no one will contradict me when I say that the very particles of calcareous matter which exist now in the enamel and dentine of our teeth will be there until they are destroyed by disease, worn away by friction, or removed bodily by extraction. It cannot be too distinctly stated that there are tissues in the body which are so slowly changed that it is not possible to demonstrate that they change at all, save in undergoing some degree of condensation after their formation, and there is matter which seems to be destroyed as fast as it is produced—probably so very fast that we cannot even obtain for examination the matter itself, but only the substances which result from its decomposition.

Between these two extremes there are tissues which exhibit very different rates of change. There is no evidence of addition and removal of material going on in the enamel and dentine after the completion of their formation, and it is probable that the matter upon which the hardness of these tissues depends is not removed at all after its deposition.

"*Of the dentinal tissues.*—The structures of which the human teeth are composed are three in number—1, dentine or tooth bone; 2, enamel; 3, cementum or crusta petrosa. Of these the two first are the most important. The third exists as a thin layer over the fang of the tooth.

"The enamel is the hardest of the three structures. The dentine is the next in hardness, and the cementum is the softest of the dentinal tissues.

"At an early period of development all these tissues were quite soft. Their hardness, like that of bone, is due entirely to the deposition of calcareous salts in the soft tissue. The formation of soft matrix, and its impregnation with calcareous matter continues to take place even in the adult, for there exists in the dentine a cavity which is occupied in the recent state by a soft and very highly vascular structure in which nerves are very freely distributed. This is called the '*Pulp.*' Upon the surface of this pulp the formation of dentine continues to go on. As age advances, the pulp shrinks and the pulp cavity becomes smaller, but the pulp is not itself converted into dentine, as some have taught.

"The greater part of the tooth is composed of dentine, and this may be regarded as the most important as well as the most constant of the dentinal tissues.

"*The development and formation of teeth.*—At about the sixth week of intra-uterine life little papillæ may be seen rising from the mucous membrane of the dental groove. Each papilla is said to consist of the epithelium and sub-basement tissue, with its vessels and nerves. The mucous membrane around each papilla is described as rising up and gradually inclosing it in a sort of follicle. The lips of the follicle rise higher, and at last reach above the summit of the papilla and close over it. The papilla thus becomes inclosed in a capsule. From the side of this follicle, before it is completely closed up, a portion is, as it were, pinched off, so that a second cavity is gradually formed by the side of the larger one, and at the bottom of this second sac or cavity another papilla makes its appearance and undergoes similar changes. This is the papilla which at length becomes the permanent tooth. My own conclusions differ in some essential particulars from the above views of Professor Goodsir, which are generally accepted and taught; but I will defer stating the differences until the anatomy of the dentinal tissues has been described.

"*The formation and structure of the dentine.*—Even by the fourth month of intra-uterine life the formation of the dentine has commenced quite at the summit of the papilla. This thin shell of dentine does not change, nor is it altered, but it remains as the summit of the dentine when the tooth is fully formed. As it extends gradually at the circumference the whole papilla increases in size, so that by the time a thin shell has been formed corresponding to the surface of the crown of the tooth, the pulp corresponding to this has already attained its full size. Across the fully-formed dentine, near the summit, lines may be observed which mark the different diameter of the pulp, and the varying degree of convexity of the upper surface as the formation of the tooth progresses.

"It must be distinctly borne in mind that the dentine grows constantly in one direction only, from without inward, and therefore, when the extreme *circumference* is once formed, it is not possible that the tooth can increase in diameter by dentine, since dentine is never formed upon its outer surface. These processes continue, and the tooth gradually increases in depth by the formation of the fang which projects downward toward the socket which is being formed for its reception.

"The actual tissue which becomes the dentine differs materially from that of which the great body of the papilla is composed. Before any dentine is formed, and immediately beneath the dentine last formed at all ages—between it and the vascular and nervous pulp—is a layer of what looks something like nucleated columnar epithelium. This tissue consists of elongated cylindrical bodies, or cells with 'nuclei,' which are placed at right angles to the outer surface of the pulp. Although the pulp diminishes in size while the formation of the dentine proceeds, the pulp does not become the dentine. Nor is the dentine formed by the *deposit* of calcareous matter *beneath the 'basement membrane,'* as has been asserted by Prof. Huxley; but this dentine results from changes occurring in a tissue which lies upon the surface of the pulp. This consists of cells like columnar cells. These elongated cells are not separated from the nerves, vessels, and connective tissue of the pulp by a demonstrable basement membrane, but their extremities pass among the fibres of the connective tissue, and in some instances seem to be continuous with them. The relation seems similar to that which exists between the epithelial cells in contact with and adhering to the tissue of a papilla of skin, or of the tongue, or of the mucous membrane of the fauces, and as in these cases prolongations from the cells seem to pass among the fibres of the connective tissue. It is possible that some may be continuous with the so-called connective tissue corpuscles. As new dentine is formed, these cells encroach upon the pulp, the constituent tissues of which gradually diminish in amount.

"The changes taking place in the formation of the organic matrix, after it has been formed by the cells, can be studied quite as satisfactorily in a fully formed as in an embryo tooth. The changes occurring during the formation of the dentine as it proceeds in the adult tooth are, indeed, of the same nature as those which take place during the development of this tissue in the embryo."—(*Dublin Med. Press.*)

Teeth of Man.—The *Med. Times and Gaz.* gives the following summary of Prof. Huxley's lecture on this subject, at the Royal College of Surgeons, London. "The form, arrangement, and mode of succession of the teeth constitutes an important subject of study in connection with the structure and classification of the mammalia. The teeth of man are composed of the ordinary constituents, cementum, dentine, and enamel, are fixed in alveolar sockets, and consist of a temporary and permanent set, the latter replacing the former vertically. In both jaws the range of teeth form an arch, with the horizontal surface very nearly level, but the planes of the grinding surfaces of the upper molars look slightly outward, the reverse being the case with the lower ones, so that the inner edge of the upper series and the outer edge of the lower series become worn first. The upper incisors bite in front of the lower ones, and the direction of the axis of the lower canine is slightly in advance of that of the upper. The line of the teeth is unbroken by any such intervals as usually occur in the lower animals.

"The teeth are divided, for convenience of description, into incisors, canines, premolars, and molars. The incisors are defined—at least, as regards those of the upper series—as those teeth which are lodged in the premaxillary bone. The suture which limits this bone is soon obliterated in man, but traces of it can often be seen on the palatal surface. The tooth situated immediately behind the premaxillary suture is called the canine, but there is no absolute mode of distinction between it and the succeeding teeth, or premolars. The peculiar form and size is the general test adopted, but this fails in the examination of the dentition of some animals. The molars are distinguished from the canines and premolars by their mode of development; they do not succeed any other teeth vertically as these do.

"The special characters of the human teeth are the following: In the upper jaw the incisors are two on each side, single-fanged, adz-shaped, narrow from before backward, and with broad, cutting edges; the outer are smaller than the middle pair. The canines are obtusely pointed, wedge-shaped in section, not larger than the inner incisors, with a stout, long fang, which causes a marked projection on the outer surface of the maxilla. The premolars, two on each side, are much like each other, have an elliptical transverse section, fang single or more or less divided, crown with two cusps, outer and inner, of about equal size, though the outer projects somewhat beyond the level of the other. The true molars are three in number; the two anterior of nearly equal size, and the posterior smaller. Their crowns are of quadrate form, with a peculiar pattern on the surface, composed of four projections or cusps at the corners, with a depression between them crossed diagonally by a ridge which connects the anterior internal with the posterior external cusp. This pattern is less definitely developed on the posterior molar. In the lower jaw the number of each class of tooth are the same as in the upper. The discrepancy of size in the incisors is not so great, and the inner one is the smaller of the two. The canine is not so large as in the upper jaw. The crowns of the premolars are more nearly circular, the inner cusp is considerably smaller than the outer, and generally connected with it by a transverse ridge. The three lower molars have somewhat larger crowns than the upper ones, and have a different pattern on their grinding surface, being divided by a conical groove into four cusps, with an additional small tubercle behind the posterior external cusp.

"A representation of the number of the different kinds of teeth in both jaws by means of symbols constitutes what is called a 'dental formula.' The number and nature of the permanent teeth of man are thus shown by the convenient signs put forward by Professor Owen:—

$$i\frac{2-2}{2-2},\quad c\frac{1-1}{1-1},\quad p\frac{2-2}{2-2},\quad m\frac{3-3}{3-3}=32.$$

The formula for the deciduous teeth is:—

$$di\frac{2-2}{2-2},\quad dc\frac{1-1}{1-1},\quad dm\frac{2-2}{2-2}=20.$$

It will thus be seen that this set, or the 'milk' teeth, as they are sometimes called, differ considerably in number from those that replace them. They differ also in their characters. In the upper jaw the crown of the first deciduous molar is considerably smaller than that of the second, and is bicuspid. The posterior one has the pattern of a true molar, and is,

therefore, more complex than the tooth which succeeds it. The same rule holds with the lower deciduous molars, the first more resembling a bicuspid, and the second a true quinquecuspid molar. As to the order of succession of the teeth in man, the principal point to be noted, in reference to zoology, is that the canine comes into place in each of the jaws before the second molar."

"*Dentition of British Mollusca.* By the REV. G. ROWE, M.A.—By way of preface, it will be well to remind the reader that the class *Mollusca* admits of a general subdivision into *Acephalous* and *Encephalous* animals, the latter alone possessing heads. And although it by no means follows that they should therefore possess teeth, or that their headless relations should not have these useful instruments, yet it is among the *Encephala*, or *Gasteropods*, that we find the subjects of our present observations. These creatures are also, for the most part, occupants of a single shell, such as that of the whelk and the limpet, but some, as the land-snails and the beautiful nudibranchs of the ocean, are naked.

"The *teeth* of a Gasteropod do not answer to the ordinary signification of the term. They are organs of trituration and abrasion indeed, but are not used for the purposes of holding or biting. Many of the shell-less mollusks have one or more horny mandibles; and in some instances these are replaced, and even supplemented, by buccal plates armed with spines. Such is the case with the genus *Natica*, and with *Cypræa Europæa.* And Woodward states, that many of the flesh-eaters have a spiny collar at the end of their flexible proboscis. These afford the means of holding the food or prey, while, what I have here termed teeth, are employed in rasping it into the mouth. The so-called teeth are silicious plates of extreme tenuity, often beautifully outlined and curved, and frequently serrated at their edges. There are generally a great number of them, sometimes many thousands, in one animal; and they are rooted in a thin membrane, named, from its form and position, the *dental* or *lingual ribbon.* As this lingual band forms a very interesting object for the microscope, and only requires a little practice for its preparation, I will briefly describe the process, in the hope that some of my younger readers may be induced by its easiness to attempt it.

"There need be no lack of subjects for examination. Periwinkles, whelks, and limpets are to be obtained in most places, even inland; but if these sea 'fish' are not to be had, then every ditch will yield *Limnæi* and *Planorbes* in abundance, or, as a last resource, the common snails and slugs of the garden and the lane must serve the turn. The apparatus may be the simplest possible. One or two ordinary needles, and as many surgical ones may be fixed into cedar pencil-sticks, or, better still, into the neat little bone holders used by ladies for their crotchet-hooks. A few sharp pins will be required to hold down the parts. A common pocket-lens must be mounted so as to slide on an upright rod, (a piece of soft wood stuck into a flat bit of lead will answer every purpose,) for the dissection necessitates some magnifying power, and both hands must be free. It will also be well to have a pair of small curved-pointed scissors, and a pair of forceps with claw-ends. They will be wanted for the larger mollusks; but in many instances the needles only can be used, on account of the great delicacy of the operation. The prime requisites are patience and light fingers; and assuming that the observer possesses both, let us now proceed to work. Select for a first example a good-sized periwinkle.

If he is alive, scald him for a second, and then you will not be haunted by any qualms about vivisection; but it will not matter for the nonce if your subject has been boiled, and even salted. Break the shell with a smart blow, and disengaging the animal, pin him down with his *foot* or walking-surface underneath. Above, and in front, there will then be seen a loosish flap of skin: that is the *mantle*, and on turning it back, it will disclose the *rostrum* or muzzle. It has two little fleshy *tentacles* at the sides, (corresponding to the horns of a snail,) and a small nearly circular aperture at the extremity, which should be turned to the right. Now cautiously insert the curved point of the scissors, and lay open the cavity of the mouth, but take especial care not to injure its floor, where it is paved with the tongue and its wondrous armature of teeth. If they are in the way, pin back the cut edges, and, with the needles, lift out the lingual band. It comes away readily, and as all the teeth are reflexed it may be drawn out forward without risk of injuring them. It will probably require cleaning, which is most conveniently managed under transmitted light. In some of the minuter examples, indeed, the whole process must be so done. To effect this, get a cigar-box; turn it on one side, and make a clean hole in the upper one, half an inch in diameter. A small mirror, or piece of plain glass blackened at the back, is to be placed inside at such an angle as to reflect the light through the hole. The object is then laid on a glass slide over the opening, and cleaned with a camel-hair brush and distilled water.

"Only a portion of the tongue is in use at any one time. This is nearly flat, and is held in its place by projections of the membrane on either side. The posterior part descends obliquely behind the mouth, and is formed into a cylinder by being inclosed in a membranous tube, which peels off like the finger of a glove turned inside out, and allows the whole of the lingual ribbon to be displayed as a flat strap. If particles of tissue adhere to it, they may be carefully removed by the brush, or the curved needle. But being very delicate, the tongue is often liable to be torn, if held meanwhile by a hard point; for this purpose a bristle is a very handy tool. The front of the tongue is in some cases folded at its end, so that the part most in use is at a short distance from the extremity. This happens especially with the carnivorous species which bore through the shells of their prey. The teeth on this portion are frequently worn down and broken, and as it is essential to the well-being of the animal to have good teeth, the reserve so bountifully provided is brought gradually forward, the worn part being at the same time absorbed. Thus a continually new rasping surface is secured. Quite at the hinder end of the tongue the teeth become rapidly imperfect and rudimental; but it admits of doubt whether they are in the act of growing, since the lingual band would appear to be originally prepared of such a length as to last effective as long as its owner requires it. In our periwinkle, the spare portion will be found beautifully coiled up in the body of the animal on the right side. That of the common limpet passes backward and downward, doubling on itself in its course, and is more than twice as long as the mollusk.

"The tongue itself is divided for convenience of description into longitudinal areas, which are crossed by the rows of teeth. Of the former there are five, distinguishable by the different characters of the teeth they bear; but they are not always all present. The teeth are consequently named the *median*, the *lateral*, and the *uncini*, although the latter are

not necessarily more hooked than the others. The areas bearing the *uncini* have been called *pleuræ*. Since each row is a repetition of all the rest, the system of teeth admits of easy representation by a numerical formula, in which, when the *uncini* are very numerous, they are indicated by the sign ∞, (infinity,) and the others by the proper figure. Thus, ∞. 5. 1. 5. ∞, which represents the system in the genus *Trochus*, signifies that each row consists of one median, flanked on both sides by five lateral teeth, and these again by a large number of *uncini*. When only three areas are found, the outer ones are to be considered as the *pleuræ*, inasmuch as there is not unfrequently a manifest division in the membrane between them and the lateral areas; but never, as far as I have observed, between the latter and the median region. This arrangement is typical of a large class, having the formula 3. 1. 3, which embraces genera so dissimilar as *Cypræa*, *Aporrhais*, and *Natica*, together with the vegetable feeding *Littorinidæ*, and the operculated land and fresh water mollusks. Again, when only two areas exist, it seems probable that this is caused by the absence of the central ones, and the teeth should therefore be termed *uncini*. Such is the case with the *Bullidæ* and the allied bare-gilled family of the *Doridæ;* and this conjecture is confirmed by the fact, that in *Cylichna* and its nearest allies, which are transition genera, a minute central tooth is present.

"This subject has been investigated by several naturalists; abroad, by Lovén and Troschel, and at home by Gray and Woodward, with a view to obtaining criteria for a systematic arrangement of *Gasteropodous Mollusca*. Up to the present time, however, their labors have only partially succeeded. The union under one formula of so many creatures widely differing in shell, anatomy, and habits, clearly indicates, that if the lingual ribbon contains generic characters, they have not yet been ascertained. At the same time, it does present differences which may offer collateral evidence in cases difficult of discrimination. It does not help us to separate carnivorous from phytophagous animals; but it seems possible to make use of it as a mark between species. For, in all the examples I have examined, there is a distinct difference between the tongues even of the most closely allied. *Chiton discrepans* is hard to tell from *C. fascicularis* by the outer parts alone; but the tongues are clearly distinct. *Patella athletica* may, it is said, be similarly divided from *P. vulgata*. The two British species of *Acmæa* afford remarkable differences. *Trochus ziziphinus* and the nearly allied *T. granulatus* is another case in point. On the other hand, the occurrence in *T. helicinus* of six laterals is one of the reasons which suggest a change in its generic name; and great lingual dissimilarity demands the separation of our two fresh-water *Ancyli*. In this way supposed varieties may be possibly decided. If, for instance, the lingual ribbon of the many subdivisions of *Littorina rudis* is constant in its characters, they cannot be received as species. Again, the position of the fluviatile *Paludinidæ* in close proximity to the sea-loving *Littorinidæ* is confirmed by the likeness of their dentition; while *Neritina fluviatilis*, with the formula ∞. 3. 1. 3. ∞, shows an approach to the genus *Trochus*.

"All the land and fresh-water mollusks without opercula show a great similarity in their dentition. Their tongues are 'like a tesselated pavement,' so regular are their numerous teeth. These are mostly rectangular in ground-plan, and armed with a single (or sometimes triple) recurved point. They are often so very minute, that their characters are barely

discernible, even by the aid of the best lenses. When this happens, we may avail ourselves of the rule established by Mr. W. Thomson, who first in England directed attention to this subject. He found that the form of the whole transverse row corresponds to certain peculiarities in the teeth, to such an extent as to be an almost equally safe guide in questions of affinity. Thus, each row passes straight across the tongue in *Planorbis albus* and *vortex*, is curved in *Limax marginatus*, and suddenly bent in *Zonites cellarius*. Whence it may be inferred that the teeth are all similar in cases like the first named, and gradually or suddenly differ in the others respectively.

"It is among the in-operculated members of the order *Pulmonifera* that we meet with the most astonishing instances of large numbers of teeth. *Limax maximus* possesses 27,000, distributed through 180 rows of 160 each. *Helix promatia* has 21,000; and its comparatively dwarfed congener, *H. obvoluta*, no less than 15,000. When it is remembered that these estimates refer to series of forms, often elegantly curved and sculptured, the total area sustaining them not measuring at the utmost more than half an inch long and one-eighth broad, we must be filled with admiration at the marvelous prodigality of the great creative power thus bestowed upon such a small part of the organization of an humble snail. And when I ask my readers to examine these things for themselves under the microscope, I venture to think that the varied and beautiful outlines and serried ranks of these delicate amber-colored atomies will be viewed with a delight, whose depth and intensity the observers of nature can alone rightly measure." * * * * —(*Intellectual Observer.*)

"*Odontological Society of Great Britain.*—The usual monthly meeting of this society was held on Monday, the 7th inst., at the Dental Hospital, Soho Square. The chair was taken by the President, Edward Saunders, Esq. Models of irregularities in the teeth, and the plan of treatment adopted, were exhibited and explained by Mr. Saunders, Mr. Harrison, and Mr. Parkes. A long and spirited discussion took place on Mr. Spence Bate's paper on the 'Pathology of Dental Caries,' read at previous meetings. Mr. Bate maintained that all enamel had a tendency to be less perfectly developed in its external surface; that in cases where there was a deterioration in the development of teeth, that external surface would be less perfectly developed than in other teeth; that it was common to find, in teeth predisposed to decay, that the external surface had a more than usually large amount of animal tissue existing in it. Passing to the dentine, he maintained that in every tooth where there was a predisposition to decay, certain marks called areolar spaces were found, and came to the conclusion that those parts were of a less perfectly developed structure, containing a larger amount of animal tissue than the other parts. The green marks deposited on the teeth were nothing more than the decay of the external membrane, and that decay was really an absorption of oxygen by the animal matter in and about the teeth, which formed carbonic acid, that decomposed the phosphate of lime and left the animal constituents of the teeth exposed, which formed a further quantity of carbonic acid, and so on."—(*Med. Times and Gaz.*)

Effects of Sugar on Teeth.—"The action of sugar upon the teeth is an undecided question. Popular belief is to the effect that the use of much sugar, and particularly of candies and sweetmeats, is a common

cause of dental caries. Drs. Paolo, Mantegazza, and Labus, of the University of Pavia, have recently undertaken a series of experiments to settle the matter. A translation of their paper may be found in the February number of the *British Journal of Dental Science.* The chief conclusions to which these investigators have come are—1st, that sugar (as sugar) does not exercise any chemical action upon the teeth, and that it does not predispose to caries; 2dly, that sugar only affects the teeth when it has undergone the acetic or lactic fermentation."—(*Lancet.*)

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"*Discovery of Anæsthesia.*—In a recent lecture, PROF. R. OGDEN DOREMUS, of New York, uses the following language:—

"'But chiefest among the blessings conferred by chemistry on our race, was the discovery of the anæsthetics. That according to the report of the Medical Society of the State of New York, made to the legislature of 1860, it was fully demonstrated that *anæsthesia* was discovered by Dr. Horace Wells, of Hartford, Conn., in 1844. It was made at one of the exhibitions of laughing gas, by Dr. Colton. A young man under the influence of the gas injured his leg, but was not conscious of the pain till the effects of the gas passed off. Noticing the circumstance, Dr. Wells requested Dr. Colton to administer the gas to him for the extraction of a tooth, which was done, and no pain experienced. This was the first surgical operation by an anæsthetic agent. After this important discovery, Dr. Wells died, and to our shame be it said, his widow left in poverty has never received the first dollar for this great boon conferred on humanity. Soon after this, ether and chloroform came into use."—(*Med. and Surg. Reporter.*)

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"*Anæsthetic Compounds of Carbon.*—Modern chemistry has placed at the command of medical art no more valuable aids than the volatile compounds at present employed for producing unconsciousness, anæsthesia, in the minor as well as greater surgical operations, and though anæsthisation by some other means appears to have been known to the ancients, yet with the exception of narcotics of a different kind, no substance was known twenty years ago as being resorted to for this purpose, although most of those at present used, were even then largely employed by chemists. It appears scarcely credible that the obvious effect of ether in producing insensibility when inhaled should not have been known to any of the great surgeons of the last 300 years and made use of for some purpose. Fairy tales and novel writers of all ages and countries introduce the magic charm of sleep or unconsciousness, wherever it seems needful that some such *Deus ex machinâ* should appear, and the great author of the 'Tale of Two Cities' uses the conceit with considerable effect, placing into the hand of one of his heroes an anæsthetic at a time which preceded but by a few years the first published suggestion from a scientific man that such an agent was really at our command.

"There appears to be no reason to doubt that Sir Humphrey Davy was the first to observe the property of nitrous oxyd gas of producing insensibility; a note dated either in 1799 or in 1818, and contained in his 'Researches on Nitrous Oxyd Gas,' suggests its trial in surgical operations inasmuch as it appeared capable of destroying physical pain, Sir H. having himself used it to relieve violent attacks of toothache. The experiments of Thénard agree with those of Davy; it was, however, an American dentist, Horace Wells, who applied it practically.

"The use of this gas, as somewhat cumbersome in its preparation, was soon superseded by that of ether. This volatile compound had long enjoyed a reputation as an alleviant in asthma, and was for that purpose employed at least as early as 1795 by Pearson. Its introduction, as an anæsthetic in surgery, whether due to Morton, Wells, or Jackson, dates from about the time when Morton employed the nitrous oxyd, but the name of the agent used appears to have first been made known by Dr. Bigelow in 1846. Then followed in rapid succession the discovery of the anæsthetic action of chloroform, of chloride of ethyl or light chloric ether, of the so-called chloride of hydrochloric ether, (Wiggers' *æther anæstheticus,*) of chloride of ethylene or elayl, (Dutch liquid,) of protochloride of carbon, sesquichloride of carbon, amylene, hydride of amyl, chloride of amyl, and aldehyde, to which must be added benzol and keroselene, and carbonic oxyd and carbonic acid among the gases.

"In order to clear up the frequent mistakes which arise from the similarity in the names of many of the compounds named above, we give below a table of synonyms and the chemical formules by which each compound is represented:—

"*Æther.* Ether. U. S. Ph. (sulphuric ether, *oxyd of ethyl*)$=C_4H_5O$.

"*Æther Muriaticus.* (light hydrochloric ether, *chloride of ethyl*)$= C_4H_5Cl$.

"*Æther Anæstheticus,* (Wiggers' anæsthetic ether,) [Aran's, Heyfelder's,] chloride of hydrochloric ether, chloride of Dutch liquor a mixture of$=\left\{\begin{matrix} C_4H\,Cl_5 \\ C_4H_2Cl_4 \end{matrix}\right\}$

"*Elayli Chloridum* (liquor Hollandicus, Dutch liquor, oil of the Dutch chemists, oil of olefiant gas, chloride of olefiant gas, chloride of hydrocarbon, hydrobicarburet of chlorine, *chlorhydrate of chloride of acetyl, chloride of elayl, chloride of æthylene*)$=C_4H_4Cl_2$.

"*Carbonei Protochloridum*$=C_4Cl_4$.

"*Carbonei Perchloridum* (perchloride of carbon, terchloride of carbon, *sesquichloride of carbon,* perchloride of chloride of ethylene)$=C_4Cl_6$.

"*Aldehydinum* (aldehyde, hydride of acetyl, aldehydic acid)$=C_4H_4O_2$.

"*Acetonum* (pyro-acetic spirit, œnylic alcohol, methyl-acetyl)$=C_6H_6O_2$.

"*Alcohol Methylicum* (pyro-xylic spirit, pyroligneous spirit, woodnaphtha, hydrate of methyl, *hydrated oxyd of methyl, methylic alcohol*) $=C_2H_4O_2=\left\{\begin{matrix} C_2H_3O \\ HO \end{matrix}\right\}$

"*Amylenum* (amylene, paramylene, valerene)$=C_{10}H_{10}$.

"*Amylis Hydridum* (hydride of amyl)$=C_{10}H_{12}$.

"*Amylis Chloridum* (chloride of amyl)$=C_{10}H_{11}Cl$.

"*Chloroformum* (chloroform, chloride of formyl, perchloride of formyl, *chloride of bichloro methyl*)$=C_2HCl_3$."—(*Amer. Drug. Cir.*)

"*Physiological Effects of Alcohol.*—The effects of alcohol on the animal frame are somewhat similar to those of the salts of cyanogen or of morphia; and it is sometimes a difficult task to diagnosticate which of these has been the main cause of the baneful results produced. Plants are soon destroyed when immersed in alcoholic beverages. In like manner, all animals that live in water die with great rapidity when immersed in spirits. The chemical effects of alcohol, when imbibed, are manifested by an absorption of water from the tissues with which it comes in contact; hence the great thirst which it produces, and the folly of drinking more

ardent spirit to quench that thirst—it is simply adding fuel to the fire. It corrugates or constringes the tissues, and thus produces a sort of crispation or singeing of the parts, such as would be produced by the application of a hot iron; hence arises the burning irritation and inflammation of the parts, and the consequent nervous excitability aroused and called into requisition to guard against the assault. The warmth which the imbibition of spirituous liquors produces is that of incipient inflammation and the consequent arousing of the nerves to repair the evil. Nervous excitement reacts upon the circulation as a tool instrumental in producing repair; hence the rapid circulation, the increased frequency of pulsation, the flushing of the face, the flashing of the eyes, and, in general, the increased animation. These, in their turn, predispose to joy and pleasure, until the vital powers finally become exhausted by exhilaration, and, according to the intensity of the alcoholic action, yield the body up to sleep, insensibility, coma, or death."—(*Humphrey's Journal*, and *Am. Drug. Circular.*)

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"*Etherization followed by Death.*—At the meeting of the Imperial Society of Medicine in Lyons, on July 20, M. Chassagny communicated the case of a lady aged 40, to whom ether was administered previously to the removal of an urethral polypus, and two sebaceous cystic tumors on the head. Thirty *grammes* of ether (rather less than an apothecary's ounce) were used; but the anæsthesia produced was incomplete, and the patient was aware that the operations were being performed. The administration of the anæsthetic was not pushed further, because the stage of excitement did not manifest itself, and because, on the contrary, general coldness and slowness of the pulse were present. On the completion of the operation, which occupied a quarter of an hour, vomiting set in; the coldness increased, and was accompanied with clammy sweats; and the patient had convulsions, attended with foaming at the mouth. The attack passed away in a few moments, but soon returned with equal intensity. After the fourth attack, the patient died. M. Chassagny considered that the patient died of eclampsia induced by etherization, which was thus the indirect cause of death. She had previously been subject to epileptic vertigo."*—(*British Med. Journ.*, from *Gaz. Méd. de Lyon*, *Amer. Jour. Med. Sci.*)

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Theory of Chemical Affinity.—"M. Maumene has written a memoir entitled 'Theorie Générale de l'Exercise de l'Affinité.' By the help of this theory he is enabled to calculate *a priori* the results of the action of sulphuric acid upon metals and metalloids; also to determine the conditions of the formation of ammonia from nitric acid, etc., to explain the phenomena of the precipitation of metals by one another from their saline solutions, to analyze a great number of the phenomena of organic chemistry, and, in fact, to calculate all the results of the chemical action be-

* As nitrous oxide exerts a powerful influence in promoting all the functions of the animal economy, especially those of arterialization, hæmatosis, circulation, respiration, innervation, and muscular and general tonicity, it will no doubt act as a very efficient antidote and restorative in all such cases of intoxication, as well as in simple asphyxia, and other depressed states of life. It may be administered, as before mentioned, either in its gaseous state by the lungs, or in conjunction with water by the mouth or bowels.—Z.

tween a solid and a liquid, or between two liquids incapable of mixture. If this theory be really correct, a great step will have been made, and chemistry will rapidly become a mathematical science."—(*Chem. News.*)

Steel made by a New Process.—At a recent meeting of the Polytechnic Ass. of the Amer. Inst., New York, PROF. FLEURY, of Philadelphia, presented a specimen of steel, made by a new process, which he regarded as of a superior quality. In relation to the method of manufacture he said, (*Sci. Amer.:*) "It was discovered some time since by Deville that if oxide of iron is mixed with wrought iron, the wrought iron will melt at much lower temperature than it will without the oxide. Mr. Gerhardt applies this principle to making cast steel by heating scraps of wrought iron in crucibles, to a high degree, and then introducing into the crucibles oxide of iron, or other suitable substance containing oxygen, and immediately after the introduction of the oxide, pouring a quantity of melted pig iron into the crucibles. The oxygen of the oxide combines with a portion of the carbon in the cast iron, and the remainder of the carbon enters into combination with the whole mass to form steel. The degree of carbonizing can be adjusted to a nicety, by regulating the proportion of cast iron in the mixure."

"*Welding Steel Cold.*—We gave an account, some time since, of the welding of steel plates, which occasionally occurs at Hecker's flouring mills in this city. The engine crank shaft is a heavy cylinder of iron standing vertically, and to prevent the end upon which it rests from heating, a number of smooth steel plates were placed in the step to revolve upon each other, and thus distribute the friction between their several surfaces. The rubbing of these plates together of course ground their surfaces perfectly true, so that they fitted exactly to each other, and at the same time made these surfaces bright. Under these circumstances it was found that whenever the lubricating material was pressed from between the plates, they would be welded together so that they could not be separated with a cold chisel and sledge. In considering this circumstance, it had occurred to us that perhaps a thin film of the surface might be heated by the friction to the ordinary welding temperature, and that, therefore, it was not a case of the cold welding of steel. In an account, however, on another page, of the drawing of steel tubes, it will be seen that when one tube is drawn over another under great pressure, the surfaces in contact being perfectly bright and clean, the tubes are welded together in the most thorough manner, and that careful observation shows that there is no elevation of temperature during the operation."—(*Sci. Amer.*)

Paste.—"The most convenient paste to be made with cold water is mucilage of tragacanth. It requires several days to be perfectly formed with the ordinary quality of gum tragacanth in flakes, but by reducing the gum to powder, and stirring it with the water, it is rapidly converted into a paste; the proportion may be an ounce to a pint, or may be varied to obtain the required consistence. Some prefer mixing the tragacanth with an equal bulk of gum arabic. If pretty firm, we find this paste keeps well without the addition of an antiseptic, though a little acetic acid or creosote will more effectually prevent fermentation."—(*Am. Drug. Cir.*)

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ORIGINAL COMMUNICATIONS.

PRACTICAL HINTS.

BY J. D. WHITE.

Prevention of Toothache.—Now that a good deal has been said on the diagnosis of toothache, it would be well to give some instruction how to prevent it. An ounce of prevention, it is said, is worth a pound of cure; and it applies with double force to the teeth, because enough is done to them while they are operated on to excite inflammation and pain without the exposure of the patient to the common meteorological influences, at all times. It is evidently just here that the mechanical and properly educated dentists separate; and it is here, too, where those who take what we may denominate as *ridiculous notions*, and those who study the teeth in their *anatomical*, *physiological*, and *pathological* conditions. In their anatomy they have the most beautiful mechanical arrangement, equal to the most perfect machine that ever was made by human fingers. In their physiology they have the same functions as any other organ or set of organs of the human frame; and in their pathology they are as susceptible to all the morbific influences of the general organism as well as any other single organ or set of organs in the body. Indeed, we may not go too far if we assert that the teeth are the thermometrical and barometrical organs of the human system. Every change of weather from hot to cold, from cold to hot, from wet to dry, and from dry to wet, or the change of the compass, impresses the teeth of one set of persons or another. Every one does not take cold at the same time or in the same organ or set of organs. Each one takes cold according to the *impressing influence* of the kind of meteorological changes of the time, and according to the *temperament* of the individual. This brings us to the understanding of the fact that we cannot "*rattle off*" our patients as fast as they come in, without any consideration, as a shoemaker would make one shoe after another spite of wind and weather. The intellect

must be employed, properly stored with the details of all that relates to our subject, and the judgment must be exercised after being matured by careful observation, in every case which comes under our care. No one human system at all times, much less the vast and ever-varying varieties coming under our observation every day, can, by any possibility, be reduced to one straight, hard, and mechanical line of practice. All such efforts deserve no other name than *quackery*. What does all this amount to? Why, simply to this: that we cannot, with positive certainty, tell from day to day what will be the result of scarcely any operation we do. A distinguished Bishop asked us not long since, what would be the result, in a given time, of a certain thing which we did for him. We answered that we had ceased to be a prophet long ago; that if we understood ourselves as far as we had got we considered ourselves very smart. He remarked that was very true, and it was a pity many more in other pursuits than our own did not think and act the same.

We have long since spoken of epidemic toothache, to draw attention to the prevalence of toothache at one time more than at another. Now, how shall we act to prevent our patients from suffering when so much seems to be in our way? We answer: by taking the condition of the teeth and the patients, as they come in with the toothache, and comparing that with the condition which we pass them out of our hands. When a tooth is decayed at all it soon becomes morbid and impressible to all the changes of the system generally, and the weather. And just so far is a tooth in a condition to be plugged as we find these circumstances to conspire in our favor; and just so far as they do not, are the chances of success against us. Besides all this, too much work on a tooth at one sitting is against our complete success. Especially is this the case when the nerve is nearly or quite exposed, or the pulp is dead. Here the subject divides into two distinct questions. These we will consider in our next article.

(To be continued.)

FILLING TEETH.

BY CORDYON PALMER.

An Essay read before the Northern Ohio Dental Association.

Gentlemen of the Association: As no particular subject has been assigned me for this occasion, and as I have been requested to prepare something for this meeting, I am left to select the subject in which I feel the most interest. I shall then, with your permission, endeavor to give a few ideas upon the varied and complicated operations of filling teeth.

Of simple plain filling I need say but little, as you are all as familiar with its operations as myself. In undertaking this subject I would say there

are fixed principles which must be kept in view, not only through the simple, but all the varied and complicated operations of filling. That a cavity in its preparation to receive the filling be kept dry, cut clean with a sharp instrument, and the filling introduced without the previous application of any corrosive agent, not even the saliva or breath of the mouth; and that the filling be introduced in such a way as to touch and press upon every part of its surface, and be so condensed as to render it impervious to air and moisture.

Purity, incorruptibility, and perfect filling are the points to be aimed at. Keeping this in view, we should so far comply with them as the nature of our cases will permit.

Of the materials for filling, we must place gold at the head of the list. Next in order comes tin foil, Wood's metal, and Hill's stopping.

Of gold it may be said that it is best as a general thing, but not in all cases; for the reason that it is a quick conductor of cold and heat, and will cause pain in many cases where tin foil will be borne with comfort. Were this not the case, we should not say gold to the exclusion of all other kinds of filling, because we could not meet more than one-fourth of the cases that would like to have our services. There are a large class that can afford to have tin fillings that cannot pay for gold.

Good tin filling will last for twenty years, and often longer; and no one will deny that it is better for a patient that they should have tin fillings if they cannot afford better, than to say if they cannot have gold that they must do without. Tin filling is a blessing to humanity; and if we could have but one of the materials for filling, we had better have tin foil. In the case of the young, whose teeth are soft and tender, there can be no doubt but that it is the best material that can be employed. Taking care not to remove too much of the partially disorganized portions in the cavities of such young and soft teeth, and filling them with tin, preserves them while nature is rapidly at work adding new inner layers of dentine, and diminishing their large and vascular pulps. In this way time is gained. Time with the teeth of the young is everything, for the reason that there are such rapid changes going on, that a few months, or even weeks, will make such a surprising difference, that a child that could be controlled only to have a tin filling inserted in the most imperfect manner at first, can submit to a permanent filling in a few months; or even if the filling should remain for a year or more, no harm can arise. Perchance it may need to be removed. By this means the soft teeth of children can be kept along until growing years gives them strength of mind and control over their nervous systems, when they can submit to permanent fillings.

Wood's metal, in many respects, is far superior to any other kind of filling, except gold. By its use the most frail and broken-down teeth, and even stumps, may be built up to any desired form, and made to articulate with corresponding teeth, and become useful.

Hill's stopping is in every respect the most satisfactory and useful temporary stopping, I think, that has thus far come to our knowledge.

Having progressed thus far, I shall proceed to give my views more minutely of the operation of filling. Formerly soft non-adhesive foil was thought the best preparation of gold for filling teeth. More recently, an adhesive quality has been desired, and found not only in foil, but in crystal gold and crystal gold foil, which is adhesive in a marked degree.

To fill a tooth in the old mode, it was necessary to introduce the gold so as to have lateral pressure against the walls of the cavity, so interlacing and condensing the gold as to have it retained by force alone, very little or no advantage being gained from adhesion. More recent experiments have proved that adhesion is desirable in all parts of a gold filling. This point established, the gold that will afford us this quality in the best way suited to our purposes, is that which we desire.

With due respect to the well-earned reputation of the men that have labored to produce the foils we have desired, I wish to give my own idea of the foil which I consider to have the most general application. That is a soft foil that will bear annealing in the flame of a spirit-lamp, making it more or less adhesive, just as may be required to suit the different points in a gold filling.

Of the operation of gold filling, our cavity is prepared not in the old way, with very particular reference to under cuts and strong walls to embrace and hold the gold, but with diverging pits at its base for retaining points, the walls trimmed, edges beveled, and the gold introduced in such a way as to overlap and bind the more frail portions of the tooth. This is done by cutting the gold into strips, rolling it into twists, and cutting it obliquely into short pieces; when it is to be picked up with tweezers, one piece or more at a time, carried through the flame of a spirit-lamp, thence into the cavity, and condensed with a serrated pointed instrument, by hand force, or the mallet, which is rapidly coming into use by all first-class operators.

I come now to a very particular part of my subject; one upon which I wish to make a point, and that is, the quality of gold foil. This, to be best, must be pure, light colored, soft, capable of being annealed in the flame of a spirit-lamp to give the desired adhesion without injury to its color or softness. That foil should retain its softness until nearly the last condensing strokes of the instrument, is of the utmost importance to making a perfect filling. All of us have our favorites, and I should like to name one foil which I think possesses these qualities in a much greater degree than any other with which I am acquainted.

S. S. White's gold foil can be annealed in the flame of a spirit-lamp without undergoing any change in color, giving it adhesion and hardness to just such a degree as may be desired.

Thus far I have spoken of plain gold filling, the preparation and quality

of the gold to be used. I will now say something of nerve operations and filling, because nerve operations are becoming daily of more interest and importance.

Of the various treatment and cappings of exposed nerves in teeth I have very little or no confidence. The nerves of such teeth, for the most part, sooner or later perish, causing the teeth to become dark and give trouble, requiring to be opened into, their nerve cavities treated, cleansed, and filled, and this is more likely to be the case when gold is the filling. Still the doctrine is, *preserve the nerves alive if possible.* Of all the means employed to protect exposed nerves in teeth, pure lead, placed carefully over an exposed nerve, and gold filling over it, according to my own observation, has stood the test of years best. I am of the opinion, however, that Hill's stopping may become exceedingly useful in such cases.

Of the removal of nerves and filling.—Suppose a case. A left superior lateral incisor decays on the anterior proximal surface; nerve exposed; cavity partly overlapped by the left central incisor. To operate upon this tooth, considerable room must be obtained; this must be done by at once wedging the teeth apart or the insertion of rubber, which in some cases I should very much prefer if time can be had, as more room can be obtained by its use than by direct wedging. I would recommend letting the rubber remain from seven to ten days, being careful to keep it from coming in contact with the gum; by this time the soreness will, in all probability, have subsided. The white erasive rubber of the bookstores is the best for separating the teeth, cut and drawn out a few times to soften it before inserting it between the teeth. To commence the operation upon this tooth, after having gained the desired room, insert a hard wood wedge, formed so as to keep out of the way the point of gum, and hold the tooth firm and steady; trim the edges of the cavity as they may require; by this means expose to view more fully the parts. If it is decided to remove the nerve, at once let the operation be carried directly on and finished up, as delay in this case would be dangerous. If it is thought best to deaden the nerve by an application, more time will be required.

The best agent for this purpose is a preparation of cobalt. To prepare the cobalt, take the common flystone of the druggists, be particular to use none but the *solid brown-colored mineral;* that which is ground into powder and that which is solid with a gray metallic appearance to be avoided. Grind the cobalt dry until fine, then add pure creosote, grind fine and bottle, with creosote to cover. This preparation improves by age, and should be prepared some time before it is used.

To make the application, free the cavity as much as possible, expose the nerve; dry it; have ready on the point of an instrument a very small portion of cotton, touch this to the preparation so as to cover one side of

the cotton, and place it in immediate contact with the nerve, not allowing it to spread, which would do harm. Stop with cotton if the cavity will retain it, if not, use wax. I do not much like wax, and use it only when cotton cannot be retained in the cavity. Having made the application in this way, let it remain until the same hour the next day, then operate, and be sure to finish, leaving no part for a second sitting. No arsenious preparation should at any time be introduced into the root of a tooth, nor used in connection with or at the same time with iodine.

My way to operate upon this tooth would be to enlarge the entrance to the nerve cavity so as to remove the nerve, after which I should follow with fine cutting instruments, as near as possible to the point of the root, using pure creosote to check the bleeding, until the last cutting on the point of the instrument comes out white and dry. Having ready prepared the gold rolled between the thumb and forefinger, so adapting it in size and length that it may suit the extreme point of the cavity in the root, keeping all parts dry, take up the gold with the tweezers, hold it in the flame of the spirit-lamp to free it from impurities, thence introduce it into the nerve cavity with a fine-sized serrated spring-tempered plugging instrument, and condense; then add other pieces, until the nerve cavity is completed, using the mallet to condense with all the time, after introducing the first piece of gold. I should then prepare and fill the main cavity, malleting all parts of the filling that I could reach in that way.

Of a dead nerve and filling.—Take the left central incisor. Decay on the posterior proximal surface; nerve dead. Cut away to make an opening, cleanse and treat until dryness and good condition is obtained. The foramen at the apex of this root will be enlarged; when dry and all ready, roll the gold and turn a loop at the point to make it smooth and the right size to fit snugly, pass it through the flame of the lamp, and introduce with caution to carry the gold just far enough; condense carefully, then add other pieces, with more force, soon bringing the mallet to bear, and finish up the nerve cavity. But do not stop here; if at all practicable, complete the whole operation. The great cause of poor success and trouble with nerve operations is delay until secondary symptoms arise, which are troublesome to control, and at best leave sore, tender teeth when done.

Some are very much in favor of introducing the first piece of gold saturated with creosote in cases of this last kind, to which I would not object; but I do know that if all has been well prepared and the gold introduced pure and dry, that it will succeed.

Of compound filling.—Suppose the first superior left molar. Decay on the anterior proximal surface; nerve exposed or dead, as the case may be. Heat as before and fill each root with gold, then finish with cylinders of tin foil, or use Wood's metal, taking care to so place strips of gold foil against the inside of the face wall of the cavity to fill against,

and by this means hide the dark shade of the tin or Wood's metal, making the tooth present the appearance of having a gold filling to the face. It has long been a practice of mine to place gold in this way against the inside of the thin face walls of the teeth when inserting tin fillings, making the teeth look well and keep their good appearance; it works beautifully with Wood's metal also.

I cannot pass over this part of my subject without giving it more notice, as it is one of particular interest to me. There are many patients who have badly decayed front teeth that cannot pay for gold, and yet they wish to have the benefit of filling. In such cases tin filling or Wood's metal will preserve the teeth, and by facing the filling with gold make them look presentable. These cases will occur for the most part with dead teeth and fang fillings; but no matter what tooth is to be filled with tin or Wood's metal, when the face of the tooth is thin enough to show through, I lay a few folds of gold foil, annealed to make it a little stiffer, and by that means easier to be kept in place, and fill against it, making a satisfactory looking filling that wears well. The question may arise, does the edge of the gold protrude with the tin or metal? I answer, it does in many cases. I would build out the front with gold filling, underneath with tin or metal. If there is no building out in the case, I lay the gold in place, holding it with an instrument with one hand while I introduce the filling with the other. When the filling is condensed, it is burnished down with the gold together and finished off, letting the gold come clean to the edge. An objection to this may arise, for it is said that the galvanic action will cause the tooth so filled to trouble. To this I can say that it is not true, as long experience has proved to me that it will do exceedingly well. Another question has arisen: that is, will not there be galvanic action at the line of immediate contact of the gold and tin that composes in this case the filling? Possibly there may some slight action of that kind take place which would cause the filling to waste a little. So do corrosive agents taken into the mouth, and the natural wear and waste cause them to wear away. We need not go into fine-spun chemical theories, whether there will be galvanic action enough to discover it by the microscope, so long as there can no action be felt, and the fillings last and give comfort to the patient and satisfaction to the operator.

It has been laid down as true that two metals cannot be tolerated in the cavity of a tooth. I am prepared to say that this is a mistake; there can be no objections to compound filling in dead teeth on account of galvanic action, and I find not the least objection to a gold facing in a living tooth filled with tin foil or Wood's metal. I have filled some as sensitive living teeth in this way as I ever did with gold or tin separately, and had no complaint.

If the filling is air and moisture proof, no galvanic action can arise;

the mistaken notion has arisen out of the fact that the fillings were imperfect, admitting the fluids of the mouth to penetrate and set up a battery. Let us make good, solid, perfectly well condensed fillings, pressed upon every part of the surface of the cavities impervious to air and moisture, and we need not fear to combine these metals.

With these remarks, having passed over my subject, let me thank you for your kind attention, and I bring my paper to a close.

WARREN, OHIO, May 3, 1864.

NEURALGIA.

BY C. P. FITCH, M.D.

Read before the New York Society of Dental Surgeons.

THE term neuralgia is derived from two Greek words, which signify nerve and pain; hence disease of a nerve. Pleasure and pain are the results of nerve excitation, perceived by the sentiency or living entity. In other words, all sensation is the perception of an impression. The degree of irritation produced by the impression determines the character of the sensation; there can be, therefore, no neuralgia without nerve irritation. The class of diseases to which this term is applicable and for which it is employed, for the want of a better, and which at times covers up great ignorance concerning their nature and origin, consists, as far as can be discovered, principally of pain and nothing else. These pains are often attended with no inflammation, no structural change in the painful part, no fever. Thought and voluntary motion very often remain intact, not in the least interfered with. Neuralgia often assumes grave importance, from the severity of suffering experienced, and demands prompt relief. Its cause and origin not unfrequently become a matter of difficult and doubtful solution. This is made apparent from a recognition of the occult sources from which the irritation may and is very liable to arise. The irritant may be quite distant from the painful part; as, for instance, pain in the thigh and testicles indicates organic, or it may be functional, derangement of the kidney. Pain in the feet may arise from stricture of the urethra; affections of the heart frequently produce pain in the left arm.

The seat of irritation may be in the brain, or in the spinal column, or in systemic conditions acting through these nerve centres, or in the trunk of a nerve leading to the affected part, or some branch of the same nerve distributed to another part, as, for instance, if a person strikes the elbow so as to impress the ulnar nerve, a tingling sensation is immediately perceived in the little finger. This is the sentient extremity of the nerve receiving the blow. Irritation communicated to a nerve, either at its origin or in its passage to the extremities, or at its terminus, may produce neuralgia, often too of an incurable character; especially is this the case

whenever the nerve receives pressure in its passage through a bony canal, wherever the removal of that which acts as the irritant is an impossibility with safety to the life of the subject.

Predisposing and exciting causes are quite numerous; as, for instance, protracted and intensified mental states; electric and anæmic conditions of body; mineral and vegetable poisons; tumors, foreign bodies, traumatic lesions, decayed teeth, exposed pulps, exostosis, dyspepsia, pregnancy, and many other conditions which might be mentioned.

Whenever it becomes a matter impossible to detect any adequate exciting cause at the point where the pain is experienced, investigation should be carried to other parts of the body, either along the trunk of a nerve supplying the painful part, or to the brain, where it is possible for lesion to exist without ever being able, prior to death, to detect the fact, or to a distant part, affecting the nerve centre through the sensory track, and thus by reflex action producing the disease in question. This is quite necessary, in order that we may satisfy ourselves in reference to its curable or incurable nature; also be able to apply intelligently remedies for relief. Neuralgia is liable to occur in all parts of the organism, but more frequently does it manifest itself about the head and face.

Writers have given to those neuralgic pains, names which correspond, in most instances, to the part constituting the seat of pain. To those about the forehead and face has been given the name of facial neuralgia, or tic douloureux, which refers the affection to one or more of the three branches of the trifacial or fifth pair of nerves.

This subject, facial neuralgia, is the topic of the present evening's discussion. I can hope, gentlemen, to do little more in the few thoughts that I may present, than to introduce the subject to your notice.

The pathology of neuralgia is unquestionably a disturbance of the harmony existing in the organizing and functional forces of the system, this disturbance announcing itself through neural substance, of which there are two kinds, vesicular and tubular, or cortical and medullary. The former has been considered the source of power, while the latter answers the purposes of conduction, but this is questionable. Brown-Séquard has shown that the former conducts sensitive impressions. In these experiments impressions were conveyed from the posterior spinal roots to the brain.

The neurine is composed principally of albumen and a peculiar fatty substance, with some phosphorus. No structural change whatever of the neurine is perceptible in the most severe attacks of neuralgia. Post-mortem examinations give no satisfactory evidence of lesion in this structure. The character of the pain is often as sudden and abrupt in its inception and termination as is its occult origin; subjecting the sufferer to torture and almost death at one moment, and in the next taking its unceremonious departure, leaving no traces of its having been present but

in the fact of great mental and physical exhaustion. This circumstance proves, most conclusively, to my mind that this disease is dynamical in its origin. Its exciting cause is anything that acts as an irritant to nerve structure. I mean by nerve structure everything appertaining to it, both of a solid and fluid nature. What direct effect an irritant has upon nerve substance is a matter yet quite speculative.

Recognizing its pathology, as a lesion of the organic forces it is quite apparent why its causes are so occult and multiplex. The dental operator is frequently brought in contact with facial neuralgia, and is often applied to for relief in the extremities of distress. It is important, therefore, as far as possible to understand its nature, exciting causes, the structure directly involved, and its treatment. To recapitulate in part: its nature is primarily a disturbance of organic forces; its exciting cause is always an irritant; the structure directly implicated is nerve substance. Its treatment I will now endeavor briefly to consider. A clear recognition of the character and locality of the irritation is highly necessary, in order to afford relief either by medication or the knife. In the first place, discover and remove the irritant if possible. If this cannot be accomplished permanent relief is out of the question. It may be well to glance for a moment, at this point, at the character and locality of the pain in facial neuralgia. As I said before, the nerve implicated is the trifacial or fifth pair. Whenever the pain issues from the superciliary notch, involving the upper eyelid, forehead, eyeball, etc., the disease is referable to the first branch of this nerve, which makes its exit at the superciliary foramen. It affects all those parts to which this branch of the nerve is distributed. The forehead, brow, and upper eyelid, and frequently the ball of the eye are more or less involved, depending upon the severity and protractedness of the attack. In severe cases the eye is closed; the arteries throb and pulsate, occasioning a flow of tears. Sometimes there is produced a blood-shotten condition of the conjunctiva, and the skin of the forehead is much corrugated. The pain is piercing and often paroxysmal, as is the case more or less with all neuralgic pains. When the pain is referable, as proceeding from the infraorbital foramen, the second branch is the source of trouble. It produces a twitching of the under eyelid, a burning or prickly sensation of the cheek, affecting the under eyelid, cheek, ala nasi, upper lip, and not unfrequently extending to the teeth, antrum, soft and hard palate, root of the tongue, and terminating at the mesial line of the face. When the lower or third branch is diseased, the pain issues from the mental foramen. It radiates upon the chin, lower lip, extending to the alveolar processes, teeth, side of the tongue, and terminating abruptly at symphysis of the inferior maxillary. The pain at times passes to the ear, temples, sides of the head and neck, even to the shoulder. Especially is this the case when the irritation arises from a diseased dens sapientia.

The exciting cause of facial neuralgia is more frequently found in diseased teeth and exostosis of their roots than all others combined. Then again the teeth have nothing to do with it whatever; some morbid condition of the osseous structures of the face and head proves to be the exciting cause. Dr. Watson, an English writer of celebrity on medical practice, relates an instance where a medical gentleman of some repute, Dr. Pemberton, was attacked with facial neuralgia. The doctor proceeds to say it completely ruined him, compelling him to abandon his business. He ultimately died of apoplexy. When his head was examined after death the os frontis was found to be unusually thick, and on the falciform process of the dura mater, at a little distance from the crista galli, a small osseous substance was discovered, nearly half an inch long and almost as broad.

The treatment in facial neuralgia cannot be confined to specifics, though many have appeared from time to time, proving highly useful in some instances, and failing entirely in others. In the case just cited all treatment was utterly futile. Hence the importance of discovering, if possible, its cause.

Whenever the teeth and contiguous structures are found in a diseased condition, we may reasonably suspect the irritation to arise from this source. A restoration of these organs to health should be earnestly sought for and secured if possible. If the cause arises from general debility, tonics are urgently called for. Carbonate of iron is among the most potent constitutional remedies. Valerianate of ammonia, chloride and iodide of potassium have at times been employed with favorable results, especially where the cause is a constitutional one, proceeding from malarious poisoning and defective elimination.

In districts where ague and fever prevail, an alkaloid principle, quinia, morphia, and even strychnia have afforded relief. The latter of these agents should be used with care; the 30th of a grain is its usual dose.

Particular attention should be paid to the stomach and bowels. Much irritation and disturbance prevail throughout the entire alimentary tract. Cathartics will be found at times giving relief.

Neuralgia is frequently complicated with rheumatic difficulties. When this is the case, remedies which have proved beneficial in rheumatism should be employed, such as opium, colchicum, guaiacum, pills of galbanum, etc.

If no relief is afforded from the exhibition of constitutional remedies, we should turn our attention to topical treatment. Indeed, local applications are, at times, of primary importance.

There has been a resort at times to a division* of the nerve. At one

* Dr. Pemberton, I believe, was the subject of this operation. The cause must determine its efficiency.

time sanguine expectations were entertained of its efficacy. But we cannot say much for it at the present. Acupuncture has been used; but I am not prepared to say with what success. It is, at present, not much used. Anæsthetic ointments have been and are still used with better results. Aconite ointment will be found, in some instances, affording speedy relief. It may be used upon an external surface in the proportion of vi. grs. of the alcoholic extract to the ounce of cerate. Chloroform, electricity, and pressure of the hand upon the painful part have mitigated the severity of the pain, and at times afforded entire freedom from pain.

Mr. President and gentlemen, a large number of cases, with their successful and unsuccessful treatment, might be cited from the books, but I forbear, hoping that a mere allusion to this occult subject, which I have hardly accomplished in this paper, will stimulate to personal and protracted investigation.

New York, May 18, 1864.

DENTAL TEACHINGS.

BY WM. H. ATKINSON, M.D.

Read before the New York Society of Dental Surgeons.

Every sort of teaching has its advovate, who affirms with great confidence that his particular school or method is *the* one upon which to rely for rapid and sure advance.

All schools in medicine, surgery, and dentistry, so far as I know, are in the habit of requiring a nominal or real pupilage, measured by *time* spent, or said to be spent, in what is called "study of the principles and practice" pertaining to the particular field of investigation.

The best way to learn what school or course most facilitates acquisition, is a close survey and sharp scrutiny of those in practice of medicine, surgery, and dentistry.

And let me ask who are the *men* in each department? Are they from the schools replete with erudition? or are they not rather the so-called rough, uneducated, strong mind from the country?

And why is this so? Is it because schools are unnecessary, and a hinderance to true progress? or is it not rather that the practice of those holding the positions of teachers in depending upon obsolete formularies to lighten the labor of their teaching, that so many self-taught men are the superiors of those of equal talent and energy, who have sedulously passed the ordeals of the schools?

Mere memorizing of formularies will never illuminate the understanding.

It requires that our queries be answered to our individual apprehension, to constitute them bases upon which we can depend in the days of

our need in practice, when we shall have no teacher or book at hand upon which to shirk the responsibilities we have taken upon us, when announcing ourselves doctors, surgeons, or dentists. I, too, have my pet method and means of teaching, and that is to hold familiar, and laborious, and sometimes humiliating conversations with my pupils, on all the subjects which engage our attention; and thus demonstrate as we go, so far as we may, all the doctrines and practices I advocate.

Blind adherence to precedent is probably the greatest barrier in the way of dental teaching. He who would do his class the greatest good in the shortest space must begin "de novo," and really sacrifice himself to their benefit. He must not only feel that he knows but little about the matters desirable to teach, but also be willing that he so appear to his earnest fellow-seekers after truth!

In view of this statement, is it any wonder why so many graduates of the various schools are so vitally deficient in diagnostic and manipulative ability?

Who among us all is in the least fit to teach, if what I say is true?

Isolation of chairs, schools, and investigators may facilitate discovery, in special directions of laborious detail, but fusion of chairs, and schools, and close fraternity of labor and mutual interest among investigators, can alone establish knowledge in associate or codified and useful forms!

What then shall be done for dentistry in view of these apparently insurmountable obstacles? The best course to pursue for this and all time is, to make the main object of teaching and learning to consist in the attainments of knowledge by both teacher and pupil! irrespective of the time said to be spent in study, or who or what the pupil may be who applies to us to enter our classes;—making no unnecessary conditions, nor opening any door by which unqualified persons can by possibility attain the indorsement for acquirements they do not possess!

My ripest judgment tells me this end can in no known way be so readily attained as to make all our teachings consist in conversations, and lively discussions, and clinical demonstrations, in which all are required to enter with child-like earnestness and fraternity.

Just so soon as each mind is set fully at liberty, by assuring it that it is safe to allow others to know how deplorably deficient it feels itself to be in matters of really demonstrated knowledges, we shall have such a oneness of aspiration as to make it next to impossible to hold us back from the attainment of demonstration to our inquiries!

The real investigator in matters of science is above or below, whichever you please, the petty desire to domineer over other men's minds and pursuits, and willingly accepts and adopts whatever of demonstration he is favored with by his fellows; nor is he slow to give due credit and acknowledgment to all such noble helps against the host of ignorance with which we all have to contend.

All that dentistry is, it owes to the eminently demonstrative character of its nature, and an almost untrodden field for its investigators. And although we can never abrogate the necessity of anatomical principles and facts, yet where these have not been understood nor explored, we may not look to be benefited by our predecessors.

If we are to have "Dental Teachings" culminate in a well-digested code of "dental institutes," it behooves each one to communicate all the knowledge he possesses to the common stock, that it may become indeed common; and thus serve as a substratum upon which to stand to make yet further researches into the elements constituting it a science; which, when attained, is sure to make our most brilliant present knowledge appear as but letters in the alphabet of the coming histology, physiology, and pathology of dental tissues, and teachings of doctrines how to prevent and how best to remedy the aberrations from healthy function to which these are now liable!

New York, May 16, 1864.

NITROUS OXIDE NOT AN ANAESTHETIC.

BY C. W. FOSTER, DENTIST.

This statement will undoubtedly strike the high-priests of this Moloch as being heresy, meriting their bitterest anathemas; for at every line of numerous pages they assert that nitrous oxide is an anæsthetic of the first class—that it is absolutely safe and judicious! Some advertise that they give it "to the most delicate in health." Another, that "diseases of the heart and consumption are no impediments to its use!"

Where are we as a profession drifting, if such is the extent of our attainments? What amount of opprobrium will the great body of faithful dentists receive by the unprincipled leaven of empiricism working in their midst?

We perceive that the prime instigators of this movement are not dentists, and do not have the responsibility or the good name of the profession at heart, and are not sensitive as to its issue, save, perhaps, in a personal manner, for Othello dies when his occupation's gone.

When I say nitrous oxide is not an anæsthetic, *per se,* I mean strictly so; that without the dangerous narcotizing power of carbonic acid gas, which is exhaled and confined in the bag, and is rebreathed again and again in ever-increasing proportions, *its present effects would not be producible.*

Nitrous oxide may be given pure and with the greatest caution; it does not affect the statement just made; the principle is the same. Nitrogen does not support combustion or respiration. Free oxygen supports both, but the two gases chemically united, as in nitrous oxide, do not support respiration, but slightly if at all; but they are more power-

ful for combustion in the body than even pure oxygen, as pure oxygen is but slightly absorbed by the fluids of the body, while "nitrous oxide is rapidly dissolved in the blood, and carried by the circulation to every part of the body, *oxidizing whatever is in its path.*" (*Draper.*)

That nitrous oxide supports combustion in the body, is seen in the remarkable exhilaration of oxidation at exhibitions, etc.; that it cannot support respiration or life but a few moments, is seen in that frightful gasping of the patient, growing deeper and faster, *as he dies for want of air.* These are the symptoms that precede the stupor and insensibility of this wondrous anæsthetic!

Let us look, for a moment, at the agent that is called in to produce this stupor, as nitrous oxide will not alone produce unconsciousness, save at the final delirium of dissolution or oxidation. Let us look at this carbonic acid gas, and see if it is safe even in the best of company.

Carbonic acid gas when respired destroys life. "When breathed pure it produces spasm in the glottis, closes the air-passages, and *kills suddenly* by suffocation." When diluted with even *ten times* its bulk of common air, or *diluted with nitrous oxide and taken into the system*, it acts as a *narcotic poison, gradually producing stupor, insensibility, and death!*

This nitrous oxide, with the aid of the deadly poison of carbonic acid gas, is able to throw the strong spirit of the human body in a few minutes! We should beware of its suddenness, or at least those that have "the cheek" to use it should do so if they will persist in its criminal and fratricidal use. In an article, by Colton, of *gas* notoriety, I perceive he makes great ado over the fact that nitrous oxide (its gas or water) may be used to advantage in asphyxia from chloroform. Well, I agree with him, or more truly, with Dr. Ziegler, who first made the observation; but would inform Mr. C. that he must not by any means allow the gas in such cases to become contaminated with the carbonic acid gas, to the extent that every one of his patients must necessarily take it to produce the desired effect of anæsthesia. (?) Mr. C. has not of course told you that asphyxia (or "death's door," as he poetically terms it) could be more readily and generally produced by nitrous oxide *as given*, than by chloroform or ether. Of course we may be informed that it will not always do to speak the truth even. I can well conceive how it would apply in this case, but strict honesty of purpose should be our aim, for or against, since it is due to the people and the patients who so confidingly place their lives in our hands. I claim that there is always more or less risk in taking away "the senses," and only warranted, as a general thing, in grave or capital surgery. I also believe that anæsthetics are comparatively safer *as the pain is greater in proportion*, and know that minor surgery has lost a hundredfold more victims than capital surgery! This is substantiated by abundant facts.

In so short an article I cannot touch upon all the points of this vitally interesting question, but may at some future season endeavor to point out more fully the danger of this gas in question as now given, and present numerous new cases of its *undesirable* effects. An evil in this matter, almost as considerable as its danger, is the mania for tooth extraction under this new system. This cannot be too strongly condemned by every dentist.

Says Dr. Rolfe, (in the *Boston Medical and Surgical Journal,*) and very truly, too: "The nitrous oxide epidemic is causing the loss of thousands of teeth that there is no more necessity of losing than there is for the loss of a finger with whitlow, or a foot with chilblain." Amen. And further, we too frequently administer anæsthetics as a profession, and with some "this wonder" is used with a nonchalance which would be perfectly refreshing of a hot day.

In general, upon anæsthetics, the following excellent advice, by Dr. Thos. E. Bond, should be the fundamental rule and practice of every faithful and intelligent dentist in the land: "When we consider that the extraction of teeth is not a dangerous operation; *that the pain of it is not a bar to its being performed quite frequently enough;* and that the administration of anæsthetics in the dentist's chair is quite hazardous, *common sense* requires us to abstain from the use of it in ordinary operations of the kind. Yet cases may occur where the morbid sensations of the patient, or the peculiar difficulty or severity of the operation may authorize anæsthesia." But *nitrous oxide and carbonic acid gas* is not to be advised then.

Shelburne Falls, Mass.

DENTAL NOMENCLATURE.

BY L. C. INGERSOLL.

I have taken my pen to do a thing I have many times had "half a mind" to do—that is, to criticise the use of one or two words, which, I know not how or by whom, have, very unwarrantably I think, been foisted into our dental nomenclature.

Words are the media for the communication of ideas. Every important word in common use has associated with it a definite idea. A new idea requires either a new word, or a compounding of words, or a circumlocution of words to express it. Or it may require a common word to deviate from its original meaning, because in the idea which it expresses about *one* thing there is a similarity to the idea sought to be expressed about *another* thing. This is a figurative word. Or if applied to a science, art, or profession, it is a technical word. In the developments of science, new words and technical words are a necessity, for obvious reasons. But the greatest caution is needed in introducing

them so as neither to obscure the meaning nor convey a wrong meaning. In our dental nomenclature we have words full of appropriate expressiveness. They contain distinctive ideas. They are therefore necessary, and are appropriate in proportion to the distinctiveness and completeness with which they express the idea intended. We call a certain class of teeth *incisors*, from a Latin word which signifies to *cut*, to *separate.* From this word we get an idea of the shape and of the use of the teeth thus named—being beveled toward an edge, like cutting and separating instruments, and used to separate from a too bulky mass a portion of suitable dimensions for mastication.

We call another class of teeth *cuspids*, from the Latin word *cuspis*, which signifies a point, and the word distinguishes this class of teeth from the others by their being pointed. We call others *bicuspids*, because they have two cusps or points. We call others *molars* from a Latin word signifying *crushing, grinding;* and the term appropriately defines the use of this class of teeth in crushing and comminuting our food. But whoever perceived any appropriateness in calling that portion of a tooth sunk in the alveolus and covered by the gum a *fang?* This is a common word, a well-known word, and has associated with it in the minds of all persons a definite and rather repulsive idea—and that is a something pointed with which to seize, catch, thrust, rend, tear, poison. It is proper to call the tusks of a wild boar, a wolf, or the poison teeth of a serpent, *fangs.* It is also proper to call the claws of birds of prey, of cats, and of lions, *fangs.* But whoever conceived the idea of applying this old Saxon word, with its very significant meaning, to what is more familiarly known as the root of a tooth? With much greater propriety might we call the instruments with which it is extracted *fangs!* Yes, call the forceps, if you please, not *fang* forceps, but *fanged* forceps, and I will have no words with any concerning the significance of the name.

The term *root* may or may not be the best term to be found to name that portion of a tooth confined within the maxilla. It is certainly not inappropriate in its signification, for like the root of a tree it is both a functional and physical support. Like the root of a tree or plant it is covered and excluded from external influences, but holds vital relationships with the parts immediately surrounding and in contact with it. Like the root of a tree it has absorbents, vessels, tubuli through which pass and repass the nourishing and waste fluids. It is like the root of a tree in supporting the body of the tooth in firm position against the power of mastication which tends to topple over or dislodge it. For these reasons, among others, its appropriateness is apparent.

Till the word-makers furnish us a more significant term, let us only have *roots*, and not *fangs* to human teeth. Enough now, perhaps another word at another time.

KEOKUK, IOWA, March 15, 1864.

SENSITIVE DENTINE.

BY HENRY S. CHASE, M.D.

Remarks on the Report of Proceedings of the Brooklyn Dental Society, published in the DENTAL COSMOS for April.

I FULLY agree with those gentlemen who advocate the use of sharp instruments in excavating. It is a cruelty to make use of anything less than keen-edged excavators on sensitive dentine; burrs and drills should always be avoided in this case.

I have used different remedies at times to obtund the sensibility, but where it is possible to avoid it I never use them. I have found both sulphuric ether and chloroform beneficial in some cases; in others it would fail. Where there are several large cavities to be operated upon at one time, I apply either of these remedies to them frequently while excavating another cavity. I would earnestly warn young members of the profession against the free use of arsenic or its combinations in the removal of sensitive dentine. It is a very dangerous agent. I have used it occasionally for twenty-one years, and will relate a case which occurred in the first year of my practice:—

Case 1.—A young man, age eighteen, lymphatic temperament, white teeth, soft, easily excavated, very sensitive. Applied ars. creosot. morph. to lateral cavities of four upper incisors, to remain in twenty-four hours. Cavities not deep. Patient returned next day, and I removed "paste," excavated, and filled with gold. Four days after he returned with pain in these teeth. On examination found them red. Knowing no better at that time I prescribed an anodyne application to gums, and dismissed the patient. I, however, saw him daily. The pulps died in these teeth; the color changed gradually to a dingy white. Of course blood extravasating and entering the tubuli caused the redness. These teeth never to my knowledge ulcerated. After this I was very careful how I applied the paste. I think, if used, it ought not to be left in the teeth over six hours. The younger the patient the less time. The next case may surprise my readers as much as it did me.

Case 2.—February, 1864. Mr. C., nervous from drinking coffee, but of a sanguine temperament, powers of life at this time a little depressed, age thirty-five, teeth yellow and very dense, applied to have a superficial labial cavity in the right upper central incisor plugged. Surface of decay black and hard; not sensitive, excepting at the junction of the enamel and dentine, where it was exceedingly so. Patient declared he "could not stand it," and he was so restless that it was impossible for me to operate. Applied arsenical paste, and told him to report in fifteen hours. At the appointed time saw my patient, removed arsenic, cleansed and filled cavity without trouble. At the end of a week patient called and exhibited his tooth, which was very sore to touch, and red. Removed

filling, drilled an eighth of an inch to the pulp cavity; pulp dead. I was satisfied it must be when I saw the dentinal tubes filled with blood. I removed pulp, and applied carb. soda one week to remove color from dentine; afterward plugged the tooth, since which time all has been well.

The decay in this case had only extended through the enamel; this fact, together with the age of the patient and the density of dentine, seemed to point out arsenic as perfectly safe. Every one can draw his own conclusion. I use as little of the paste as can be absorbed by a pledget of cotton of the size of a pin's head, and secure well with wax and cotton worked together. Did the dentinal tubuli absorb the paste, or did death of the tooth come through the dentino-enamel membrane? I think the latter, as the whole tooth was very sore to press upon or even touch, and I shall be surprised if it does not some time ulcerate.

INDEPENDENCE, IOWA.

PROCEEDINGS OF DENTAL SOCIETIES.

PROCEEDINGS OF THE ODONTOGRAPHIC SOCIETY OF PENNSYLVANIA.

REPORTED FOR THE DENTAL COSMOS BY R. J. HOFFNER, D.D.S.

THE FIRST ANNUAL MEETING of the Society was held at the Philadelphia Dental College, on Tuesday evening, May 3d, 1864.

Vice-President, Dr. C. A. Kingsbury, in the Chair.

Dr. Kingsbury, at the beginning of the meeting, presented Dr. Gilliams' regrets at his inability to be with the members at their first annual meeting, together with his best wishes for the future success of the Society. Dr. K., in his remarks, said that the oldest dentist in America, who had the honor of being the first president of this Society, did not, though upwards of 80 years of age, feel any the less interest in his chosen profession, but even when almost in the grave, felt still a pride in its progress.

The minutes of the last meeting were then read, by the Secretary, and adopted.

The reports of officers and committees being in order, they were submitted, as follows:—

The Recording Secretary, Dr. Lusson, stated that he had upon the rolls the names of 55 members. Of these, 30 were Active, 19 were Corresponding, and 6 Honorary. During the year the Society has lost by death one member, Dr. H. Leibert, of Norristown. Fifteen regular and adjourned meetings had been held in the course of the year, at which a number of essays had been read and discussed.

The Corresponding Secretary, Dr. McQuillen, stated that the correspondence in his department had been confined to notifying members of

their election. The answers received from Corresponding and Honorary members had invariably expressed a warm interest in the Society's success, and the feelings of some were markedly manifested by the presentation of copies of works, of which they were the authors, to the library, and these received an additional value under such circumstances. In conclusion, he congratulated the Society upon the additions which had been made to its list of members during the past year.

The Treasurer, Dr. Wardle, represented the finances to be in a very favorable condition, the balance on hand at the end of the year being $48.37. A committee was, upon motion, appointed to audit the Treasurer's account, who subsequently reported it to be correct.

The Librarian, Dr. Henry, reported that there had been presented to the Society, from its different members, 34 volumes, in addition to which Prof. J. Taft, of Cincinnati, had promised the *Dental Register of the West* from the beginning up to the present time. The *London Dental Review* for 1863, and *Scientific American* for 1864, had also been subscribed for.

The Committee appointed to procure a gold medal, to be presented to Dr. N. W. Kingsley, of New York, reported it ready for presentation. One side of the medal is a fac simile of the Seal of the Association, viz.: having around the margin, "ODONTOGRAPHIC SOCIETY OF PENNSYLVANIA, INSTITUTED 1863," and in the centre the Etruscan lamp with a pen and excavator crossed, with the motto "LABOR BY DAY, STUDY BY NIGHT" in a scroll underneath; on the reverse is inscribed, "PRESENTED TO DR. NORMAN W. KINGSLEY, FOR IMPROVEMENTS IN ARTIFICIAL PALATES."

The Society then proceeded to elect its officers for the ensuing year, resulting as follows:—

President.—Dr. C. A. Kingsbury.

1*st Vice-President.*—Dr. J. L. Suesserott, of Chambersburg.

2*d Vice-President.*—Dr. Wm. Gorges.

Corresponding Secretary.—Dr. J. H. McQuillen.

Recording Secretary.—Dr. R. J. Hoffner.

Treasurer.—Dr. Thos. Wardle.

Librarian.—Dr. Wm. P. Henry.

Executive Committee.—Drs. J. Foster Flagg, Wm. P. Henry, and Geo. W. Ellis.

Dr. Kingsbury returned his thanks for the honor thus unexpectedly conferred upon him, and would endeavor, so far as it lay in his power, faithfully to perform the duties incumbent upon him. He was gratified at seeing present members of other societies from a distance. Dr. Kingsley, whose contributions to mechanical dentistry are so well known; Dr. Hunter, of Cincinnati, Ohio, who took an active part in improving artificial dentures, and who has also done much to improve continuous gum work. He was pleased to see gentlemen from the little though great

State of Delaware. He felt that the presence of these gentlemen was calculated to awaken fraternal feelings, and deemed associations of importance in elevating the profession, especially in connection with the American Dental Association, whose great object was to increase local societies, and thus contribute to the progress of dentistry.

The President then stated that Dr. N. W. Kingsley, of New York, had been requested by the Corresponding Secretary to bring one of his patients with him, and that the Society would be much gratified to hear from the doctor, and to witness the application of his ingenious apparatus.

In response, Dr. Kingsley remarked that he scarce knew what to say, having previously been before the Society, and spoken upon the subject of cleft palate, and he had an intense dislike to boring his hearers by repeating that which was perhaps already known.

His remarks upon the artificial velum and palate were general in their nature and have already appeared in the Dental Cosmos. He was gratified to know that our profession should have produced that to which the surgeons have given their hearty acquiescence, because it is an acknowledgment on their part of dental superiority in at least one direction. He stated that a number of eminent surgeons of New York had seen and strongly favored the use of his apparatus, and thought that eventually it would supersede the operation of staphyloraphy. The same was also true of a number of eminent surgeons of Philadelphia, whom he had the pleasure of meeting this afternoon at the residence of a member of this Society.

The patient of Dr. Kingsley's, who accompanied him, wearing one of the artificial palates, was then exhibited with and without the fixture; and though the instrument had been in use but eight weeks, the defect in speech was scarcely perceptible, and not at all likely to be noticed unless attention was specially directed to it. With the instrument out of the mouth the patient also speaks well, and this is a peculiarity which Dr. Kingsley has found to exist in all his patients, that when a person scarcely understood prior to using the instrument, had begun to talk well with it, he could talk nearly as well without it, and this Dr. Kingsley accounts for by supposing that muscles which have lain dormant have by means of the apparatus been brought into requisition, and their functions in this way developed. The patient, upon being questioned, stated that no irritation had been caused by the instrument from the time it had first been placed in his mouth. His capability of distinct enunciation was thoroughly tested by being called upon to pronounce a number of very difficult words, and by passing over the numerals, all of which was done to the entire satisfaction of those present.

Dr. McQuillen, who saw this patient and two others, about five weeks since, in response to a question, unhesitatingly stated that there was a marked improvement in the speech between then and now. He ac-

counted for it by the strict injunctions which Dr. Kingsley gives his patients to practice constantly the elementary sounds,—a system of vocal training which would be of advantage to many whose palates are perfect, for much of the defects of speech observable is due to the slurring of the elementary sounds. After illustrating satisfactorily the advantages of this valuable apparatus, Dr. McQuillen, as Chairman of the Committee for procuring a gold medal for Dr. Kingsley, presented it to him, with the following remarks:—

Sir: There are some who not only oppose the presentation of testimonials to those who have rendered valuable services to the world, but also act and talk as if such recognition of another's claims to consideration was so much taken from themselves. Such sentiments, however, are not entertained by the members of this Society, and I do not believe that any organization in presenting a medal to a gentleman who, by his efforts, proves that he merits it, belittles itself in the estimation of properly constituted minds; for it is but making a *just* recognition of the labor which has been done, and is, in addition, an encouragement to others engaged in efforts tending to increase the comfort and happiness, or relieve the sufferings of humanity. It is not sufficient to erect monuments to the memory of those who have served us, when their remains are mouldering beneath the sod, but they should receive that encouragement and support from their fellows, to which they are entitled, while they live. The prompt recognition and indorsement of a new and decided improvement is not only justifiable on such grounds, but also from the fact that such action on the part of an organization whose avowed object is to promote and encourage, among dental practitioners, a disposition for investigation and improvement in every direction which relates to the principles or practice of the profession, tends to make the improvement more widely known, and therefore more speedily and generally adopted and used. Considerations such as these prompted the motion, offered at a previous meeting, to present this medal; and I am glad, gentlemen, that to-night you have had an opportunity of seeing the *practical* value of this ingenious appliance, which some of the first surgeons of Philadelphia said to me to-day that they regarded as "one of the greatest improvements of the age."

Dentistry can justly claim to have added to the world two great discoveries. The first, that of anæsthesia. The second, that of giving or restoring, by a mechanical appliance, *speech*, or distinct articulation, to those who, either owing to congenital deficiencies, by accident, or through their own criminality of conduct, have had the oral cavity so affected as to make their efforts at speech almost unintelligible to others.

While claiming these discoveries for my profession, and ever disposed to stand forward in support of her rights and interests, as a medically educated man, I have no sympathy with those who, on account of the rapid

progress made by our specialty within the past half century, indulge in ridiculous assertions of our great superiority over the medical profession in having no written record, and therefore in not being bound down by the authority of books. It is said that the great profession, of which ours is but an offspring, is bound down by authority and cannot advance, and therefore it is argued that books should be burned. The world, however, is under too great an obligation to books to see them piled in mass and tamely submit to have the ill-fated torch applied, for within them is recorded the experience, the discoveries, and the thoughts of those who in the past have labored earnestly and devotedly in behalf of their fellow-man. They are to us what the alphabet and the primer are to the child, stepping-stones toward a higher and greater development and a larger field of usefulness. Burn them, and, like the brute creation, let the experience of each generation of man die with it, and the world of science would forever stand still; and in place of each succeeding generation commencing where the preceding left off, intellectual stagnation, or gyration, at best, would supervene, for it would be compelled to renew the same track. To the earnest seeker after knowledge, the books he reads, the men with whom he converses, the things he sees, are each and all made subsidiary to his education, and to increasing his sphere of usefulness and efficiency in society. Books, with him, are only of authority when their contents bear an impress of having a secure foundation in facts, and even then they are not blindly followed, but tested by the light of experience and reason, and made the start-points for further additions to the store of knowledge already acquired. Those who cry out most against books, invariably give unmistakable evidence of the advantage that would accrue to them if they were more familiar with their contents. If it did nothing more it would at least lead them to place a proper estimate on the efforts of others, and prevent them from advancing, in a grandiloquent manner, as new and original, facts, opinions, or theories, which are presented in the elementary text-books of the day, and with which every attentive and intelligent student is perfectly familiar. Such persons may succeed in inducing some to credit them with great originality; those more familiar with the records of the past, however, are not so readily beguiled. Every zealous, indefatigable worker is entitled to respect and consideration for the additions which he may make, whether great or small, to the knowledge of the world; but those who place such a poor valuation upon, and speak so disparagingly of the labors of others, must not be surprised if their own efforts are regarded in the same light and treated with equal indifference.

The invention which we have had an opportunity of examining, and seeing applied this evening, is one which would mark an era in any profession, and it will undoubtedly prove of incalculable service to the afflicted, and be placed on record by those who, in the present day, are

writing that which our own and future generations will not desire to have destroyed. In conclusion, Sir, it affords us much pleasure to present to you this medal, which is a slight testimonial of the estimation in which this Society holds the patient, long-continued effort and skill by which such a valuable boon to humanity has been effected.

Dr. Kingsley, in accepting it, said:—

Gentlemen: I am almost compelled to tell you only that I thank you, for my heart is too full for utterance, and yet I cannot but express the gratitude I feel. Coming among you, a stranger, six months ago, I was met with a kindness, hospitality, liberality, and friendship which I had not anticipated. It has awakened a feeling for this Society which I feel for no other like organization. I accept the medal with pleasure, and admire it because it comes from you, and will hold it with such a premium upon its intrinsic value that nothing could induce me to part with it.

I am in favor, gentlemen, of the utmost liberality of opinion in our profession. We have received freely from the great lights in dentistry, and freely we should give. We have had the results of their experience, and those just beginning are already old in the profession. And freely we must impart if our specialty is to be liberal in its tendencies. I am not one who will subscribe to the sentiment that you shall not benefit suffering humanity without paying tribute to me. If I did I should help destroy the liberality of the profession of dentistry. The reward will come to him who deserves it. In conclusion, I thank you warmly for this mark of your esteem.

Dr. Hunter, of Cincinnati, Ohio, expressed himself pleased with the results obtained in Dr. Kingsley's apparatus. He had been much interested in the doctor's remarks, but felt better satisfied after the opportunity had been afforded to see a patient who gave a practical illustration of its efficiency. The clear and distinct articulation of the patient was the greatest compliment that could be paid to Dr. Kingsley's skill.

Dr. Marshall, of Wilmington, Del., was happy at having come to the meeting, and to have the chance to witness so wonderful a piece of ingenuity. He was gratified at the success which had accompanied it.

He then spoke of the Society in Delaware, recently organized, and of which he is a member. It is in a flourishing condition, with every prospect of becoming a useful adjunct in adding its mite toward the progress of the dental profession.

Dr. McQuillen then delivered the following remarks upon the Function of the Cerebellum, illustrated by a vivisection on a pigeon:—

Gentlemen: As you are well aware, the cerebellum constitutes, in bulk, about one-sixth of the brain; its convolutions, however, are not only different in their arrangements, but also more numerous, and pene-

trate deeper into its substance than in the cerebrum, and, in proportion to its size, it has a greater amount of gray matter. With regard to its function there is a marked difference of opinion between physiologists and phrenologists. From the time of Gall the latter have invariably located the sexual impulse and what are denominated the brutal instincts in this organ. And a person with a large development in the posterior part of the cranium is always regarded by them as possessing such instincts in a marked degree. The investigation of physiological observers, however, is in opposition to, rather than in confirmation of such views. Thus it is found that in monkeys, frogs, and other animals who manifest the most frequent proclivity for sexual intercourse, the cerebellum is very small in proportion to the cerebrum. Again, at the Veterinary School of Alfort, near Paris, an examination of the brains of a number of *stallions* resulted in proving the cerebellum with them to be small in proportion to the cerebrum, while it was just the reverse on examining the brains of a number of *draught horses*, in which the cerebellum was invariably quite large in proportion to the cerebrum. It is also stated that an examination of the brain of a person who was known to be addicted to masturbation, resulted in finding the cerebellum unusually small in comparison with the ordinary size of that organ in man.

The view generally entertained by physiologists with regard to the function of this organ is (the one first advanced by Flourens) that it presides over, or is the co-ordinator or regulator of motion. The results obtained from experimental physiology and pathology are apparently in confirmation of this opinion. It is found, for instance, on removing the cerebellum of an animal without inflicting any injury upon the cerebrum, that while the creature gives every evidence of entire consciousness, all its efforts at locomotion are of the most irregular, inharmonious, and unsuccessful nature. In illustration of this I propose to exhibit to you a pigeon, from which, following the example of Flourens, Hertwig, Dalton, and others, I have removed the cerebellum. Prior to taking the pigeon out of the basket I wish you to observe that although the operation has just been performed, it is perfectly conscious, quiet, and gives no evidence of suffering; your attention is directed to this fact that you may not attribute the irregular motions, which will be perceptible when it is removed from the basket, to manifestations of pain. I now place it on the floor, and you observe the constant but unsteady and inharmonious efforts which it makes to fly and walk, and how it sprawls, rolls, and tumbles from side to side in its efforts at progression. This is not due to paralysis of the muscles, but to a want of control over them, and by which their action would be made harmonious.

The facts presented with regard to comparative anatomy and experimental physiology, to which your attention has been directed, afford reasonable data for inferring that this organ possesses the power of har-

monizing or uniting the action of separate muscles, rather than presiding over the brutal instincts. At the same time there can be no doubt that indulgence in venereal excess or dissipation in any direction, materially interferes with the function of this organ. The unsteady and reeling gait of an inebriate, whose mind at the same time is clear and comprehensive, can only be accounted for in this way.

It may be asked by some, what have these remarks and this experiment to do with dentistry? To such permit me to say that the varied and complicated movements which the dentist is called upon to make in the performance of his professional duties, demand the highest order of co-ordination or accurately regulated motion. To the cultivation of this not only should every energy be directed, but the greatest care should also be exercised to refrain from indulgence in any direction which shall tend to impair the function of the cerebellum.

At the close of the remarks, it was moved to elect delegates to represent the Society in the American Dental Association, which resulted as follows:—

Drs. J. H. McQuillen, Thos. Wardle, Wm. P. Henry, R. J. Hoffner, Geo. W. Ellis, and A. B. Robbins, Meadville.

On motion, it was resolved that if any vacancy occur, the delegates shall have the power to appoint a successor.

The meeting then adjourned.

DELAWARE DENTAL ASSOCIATION.

BY W. G. A. BONWILL.

A SEMI-ANNUAL meeting of the Association was held in Wilmington, April 28th, 1864.

President, Dr. Marshall, in the Chair.

Members present: Drs. Nones, Shelp, Jeffries, and Bonwill.

Drs. Wm. H. Monroe, of Chester, Pa.; Edward Lewis, of Middletown; D. T. Smithers, Smyrna; and Philip Jones, of Wilmington, Del., were elected members.

Drs. S. S. White, T. L. Buckingham, of Philadelphia, and Norman W. Kingsley, of New York, were elected Honorary members.

Dr. Bonwill was elected Recording Secretary for remainder of term vacated by removal of that officer to another State.

Dr. Smithers was elected Librarian, vice Dr. Nolens, who had withdrawn from the Association.

Drs. Bonwill and Marshall were elected delegates to the American Dental Association, to meet at Niagara in July next.

Amendments were adopted making the stated meetings upon the

second Wednesday of January, April, July, and October, and allowing discussions at the annual meeting after regular business.

Drs. Bonwill, Jeffries, and Shelp were appointed a committee to design a Seal for the Association.

Dr. Marshall read an Essay upon Dental Association. A vote of thanks was cordially tendered.

Dr. J. Taft, of Cincinnati, being present, was called upon for a speech, which was responded to in his usual forcible style; congratulating the profession generally upon the prospects, as evinced in the number of State and local societies formed within the last year. Dental progression was the theme of his remarks, urging upon all the necessity of having a high *moral* standard, and, in spite of every obstacle, raise the profession to that eminence which it justly deserves. A vote of thanks was given him for his remarks.

Adjourned until second Wednesday in July next.

NORTHERN OHIO DENTAL ASSOCIATION.

BY L. BUFFETT, D.D.S.

THE annual meeting of the Association was held in Cleveland, on Tuesday, May, 3d, 1864.

President, Dr. B. Strickland, in the Chair.

The following officers were elected for the ensuing year:—

President.—Dr. B. Strickland.

Vice-President.—Dr. C. Palmer.

Recording Secretary.—Dr. L. Buffett.

Corresponding Secretary.—Dr. B. F. Robinson.

Committee on Membership.—Drs. Palmer, Buttler, and Lyman.

Drs. Robinson, Buffett, and Hunington were appointed delegates to the American Association. Drs. Terry, Siddell, and Slosson as alternates.

Essays were read: by Dr. Palmer—subject: Filling Teeth,* giving the manner of treating difficult cavities, and the claims of the different materials used in filling. By Dr. Lyman—subject: Dental Association; and by Dr. Siddell—subject: Cheap Dentistry. A paper was read from Dr. Atkinson, on "Preparation."

The evening session was devoted to a discussion of the manner of destroying nerves and filling fangs.

Drs. Buffett, Buttler, Slosson, and Terry were appointed Essayists for the next annual meeting, to be held in Warren, Ohio.

Adjourned.

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* This paper will be found in another part of the journal.

MASSACHUSETTS DENTAL ASSOCIATION.

The first annual meeting of the Massachusetts Dental Association was held on Monday, May 16th, at which the following named gentlemen were chosen officers for the ensuing year:—

President.—N. C. Keep, M.D.

Vice-President.—I. J. Wetherbee, D.D.S.

Recording Secretary.—T. H. Chandler.

Corresponding Secretary.—E. C. Rolfe, M.D.

Treasurer.—S. J. McDougall.

Librarian.—E. N. Harris, D.D.S.

J. A. Salmon,
A. A. Cook,
B. S. Codman, M.D.,
H. F. Bishop, D.D.S.,
T. B. Hitchcock, M.D.
} *Executive Committee.*

Dr. N. C. Keep was also appointed to deliver the address at the next annual meeting; Dr. I. J. Wetherbee as substitute.

THOS. H. CHANDLER, *Secretary.*

EDITORIAL.

SENSITIVE DENTINE—ARSENIC, AND THE TREATMENT OF THE DENTAL PULP.

An article appeared in the May number of this journal on "the use of arsenic for destroying sensitive dentine," by Dr. A. C. Hawes, of New York. The article has two meanings: one of severe rebuke to those who use arsenic at all for the treatment of the teeth in any way; and the other an ironical criticism of the reports which have been made upon its use by those who employ it; and as my name has been freely used as well as the experience which I have reported with reference to its use, it is fair, nay, becoming, that I should refer to it. As to the latter part we have nothing to say whatever, as it has nothing to do with practical illustration or scientific investigation, nor is any man's mind in a proper frame to investigate a subject which has for its aim the alleviation of human suffering that takes that direction. If I have ever been guilty of such dereliction, I disclaim it as never having been my intention or studied effort. But as to the investigation of practical truth for truth's sake, for the benefit of our fellow-men and our noble profession, and to some extent scientific research, I have done all that time would permit, and for no other object than the common good of all. I have asserted that I do not complain of the practice of any one if the patient and the operator is satisfied, nor do I think that any article of mine can have any other construction.

My whole and real object has been to report fairly dental practice as it occurs to me with as much explanation and scientific principles as I am able to give. I have written *honestly;* the word "*dishonest,*" I have never used if my views did not agree with those who pursue a different practice. I would be indeed an unfaithful reporter, if I did not take as much care to refer to the dangers which beset our way in practice, as well as the good results which may follow careful manipulations and practices founded upon an intelligent understanding of the whole subject under investigation. It is necessary *honestly* to report the failures in practice carefully, to guard the ignorant and incautious against the evils which will inevitably follow if they have the audacity to "rush in" and "take the chances" in utter blindness of what they are about to do.

Now the *morale* of the question of using arsenic in the treatment of teeth: Is the practice of the "healing art" founded upon such sure principles, and are remedies used which are of such a character as to place the patient "beyond the possibility of a doubt," as to the best and most successful results? No! At this point education and experience stops. Are remedies to be discarded which can kill? No! The highest results are achieved with the most potent remedies, and many a ship is wrecked exploring new channels. How many lives have been lost by the use of anæsthetics in honestly endeavoring to discover the best means of alleviating human suffering? This part of the subject, in connection with the healing art, I supposed had long since been abandoned. In the treatment of the diseases of the human frame, of all classes the most potent remedies are the surest,—directed by the highest education and results of experience. No "safe rule" can be laid down for ignorance to be governed by in the treatment of disease, except to do nothing at all. I will give my experience with arsenic in the next number of this journal. J. D. W.

(To be continued.)

REVIEW OF DENTAL LITERATURE AND ART.

BY J. H. M'QUILLEN, D.D.S.,

PROFESSOR OF ANATOMY, PHYSIOLOGY, AND HYGIENE IN THE PHILADELPHIA DENTAL COLLEGE.

THE HUMAN TEETH IN THEIR RELATIONS TO MASTICATION, SPEECH, AND APPEARANCE.

(Continued from p. 393.)

Passing now to the second section of our subject, or the consideration of—

Speech, it will be advisable, in the first place, to define the exact difference between *voice* and *speech;* for it is a common error, even among persons of education, to speak of them as if they were one and the same

thing, and yet that such is not the case will be evident on the slightest reflection.

Voice is possessed not only by man but also by all of the vertebrata having lungs, and it results from the vibrations induced in the *vocal chords* as the air expelled from the lungs passes through the *glottis*. The sound thus created is capable of being variously modified during and after its production, and it is owing to the mutations induced by the motions of the pharynx, the velum, the tongue, the lips, and other parts of the mouth, that *speech* or *articulated voice* is produced in man, and in connection with his moral and mental endowments places him above, and gives him dominion over the brute creation, and enables him not only to make known his wants, experience, and thoughts to his fellow-man in his own day and generation, but also by the aid of the written and printed record to transmit them from age to age, thus insuring the constant and progressive development of man's moral and mental powers, and contributing to his physical comfort and well-being.

In the construction of the vocal organs of man nature appears to have combined the double mechanism of wind and string instruments, and it is on this account that it surpasses all musical instruments, by the extent, the perfection, and, above all, by the inexhaustible variety of its effects. Advantage is taken of the function of respiration to convert into a sounding instrument the passages formed by the *trachea* and *larynx*, through which the air is admitted to and expelled from the lungs. The *larynx* is a sort of cartilaginous box placed at the upper end of the trachea, and is composed of five distinct pieces, the *thyroid*, the two *arytenoid*, the *epiglottis*, and the *cricoid* cartilages, which are readily moved on each other by appropriate muscles.

The *thyroid*, which forms the upper and fore part of the larynx, consists of two lateral wings of a quadrangular shape, united in front in a longitudinal angle, which gives the prominence to the fore part of the throat, observable in men, named *pomum Adami*. From the posterior corners of the wings four processes project, which are called the superior and inferior cornua. The *cricoid* cartilage, below and behind the *thyroid*, is shaped somewhat like a signet ring, the narrow part being in front. The *arytenoid* cartilages, much smaller than these, and of a pyramidal shape, are placed one on each side on the upper posterior and lateral parts of the *cricoid*. In other words, the *cricoid* serves as a base on which the *thyroid* and the two *arytenoides* execute the motions by which the *glottis* is contracted or enlarged. The *epiglottis*, resembling the leaf of an artichoke, is attached by its base to the upper and fore part of the *thyroid*, and hangs backward over the glottis, which it closes in the act of swallowing.

These cartilages are connected with each other by ligaments, the most important and interesting of which are the *thyro-arytenoid*, which stretch

from the base of the *arytenoid* cartilages to the angle between the wings of the *thyroid;* these constitute the *vocal chords,* and the aperture between them named the *glottis,* as already stated, is the point where the breath is *vocalized,* or rendered not only sonorous but also modulated in its pitch. In the adult male the length of this fissure is from ten to eleven lines, and it is from two to three lines wide where the width is greatest. The dimensions are much less, however, in the female and in boys prior to puberty, bearing the proportion of 3:2. This is owing to the larynx of men being much larger and forming a more acute angle anteriorily. The different pitch observable in the male and female voice, and in boys is due to these variations. At puberty the larynx of boys is increased in size and changed in form, and the voice is altered. No change, however, takes place in the voice of eunuchs from whom the testes have been removed before puberty. The unsteady, bleating, and weak tone observable in the voice of old persons, is due to ossification of the cartilages of the larynx, an altered condition of the vocal chords, and loss of nervous and muscular power.

That the *voice* is produced in the *larynx* may be readily demonstrated by making an opening in the *trachea* or the *larynx below* the *glottis* in animals; this at once diverts the current of air passing from the lungs, so as to completely destroy the voice; closure of the opening, however, by forcing the air through the proper channels, restores it. If the opening is made *above* the glottis in man, as sometimes occurs in unsuccessful suicidal efforts at cutting the throat, the *speech* is lost but not the *voice.* Again, by blowing with the bellows a current of air through the tracheal end of the larynx of a slaughtered animal, vocal sounds can be produced, which may be varied by changing the tension of the chords.

The preceding and other analogous facts afford data for assuming that the vocal ligaments may be properly regarded as the organs of voice. In a quiescent state they do not lie parallel to each other, but for the purpose of *respiration* the aperture of the glottis is widely open and somewhat triangular in shape, the base of the triangle corresponding to the space between the separated *arytenoid* cartilages; the relative position of the chords, as well as their tension, however, can be varied to a considerable extent through the mobility of the *thyroid* and *arytenoid* cartilages. When, for instance, a vocal sound is made, the action commences with the contraction of certain intrinsic muscles, the *crico-thyroid,* by which the vocal chords are stretched and made tense, while they are brought close to each other, and in a parallel direction, so as to reduce the aperture of the glottis to a mere linear fissure, by the *crico-arytenoideus lateralis* and *arytenoideus* acting upon and approximating the *arytenoid* cartilages. The air, driven by a forcible expiration through this narrow fissure, not only causes the vocal chords to vibrate, but is itself thrown into vibrations, and thus the sound required is produced.

As antagonists to the muscles named above, the *thyro-arytenoideus* relaxes the vocal chords, and the *crico-arytenoideus posticus*, by separating the *arytenoid* cartilages, opens the glottis. By such an arrangement as this in the muscles of the larynx, and the mobility of the cartilages, it is susceptible of an infinite number of changes in form, and capable of producing the finest modulations in the voice. The tone, pitch, and intensity of the different vocal sounds vary with the force of the expiratory effort, the conformation of the larynx, and the degree of tension which is given to the *vocal chords.* The greater the tension of the latter, the more frequent will be their vibrations, and the higher the pitch, or the more acute the sound; while a less degree of tension of the chords and a wider opening of the glottis will produce a grave and deeper note. For the production of the deeper notes the vocal ligaments are so much relaxed that when at rest they are wrinkled, but they become stretched by the current of air, and thus acquire the degree of tension necessary for vibration.

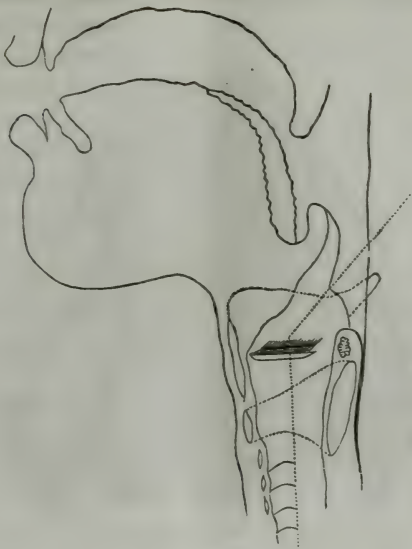
The force of the voice in man depends greatly on the capacity of the lungs and the volume of air which may be expelled from them in a single expiration. This is a point which claims special attention from those who are compelled to speak in public; for much of the discomfort which audiences endure in *listening* to some speakers is owing to the fact that in place of the voice being formed by a steady and uninterrupted current of air welling up in *expiration*, from lungs which were filled to their utmost capacity in *inspiration*, it is produced by the feeble expiration from organs but half inflated, in this way straining the vocal apparatus of the speaker and trying the patience of his auditory. Ignorance of this fact is the most prolific cause of so many clerical gentlemen suffering from *laryngitis*, or *clergymen's sore-throat.* Medical and other teachers often speak for a greater number of hours each week, and yet one seldom if ever hears of their being afflicted in this way, and the same is true of lawyers at the bar, and the majority of public speakers.

Such being the mode in which vocal sounds are produced in the larynx, the next step will be to consider the modifications they undergo in passing through the cavities of the pharynx, mouth, and nose, by which they become not merely vocal but *articulate* sounds, and constitute the elements of speech.

The voice, formed by the passage of the air through the glottis, acquires additional force and intensity, and becomes much more sonorous by the reverberations of the sound in the mouth and nasal cavities and the sinuses with which they communicate. When these cavities are closed by coryza, or the presence of a polypus, or the growth of other tumors, the voice is sensibly weakened and affected, so that it is said to be nasal, though in truth it is not, for it suffers from want of the modifications which it should receive in the cavities connected with the nose. The roof of the mouth, formed by the hard and soft palate,

serves as a sounding-board, on which the voice impinges, and is then driven from the mouth. (See Fig. 1.) When the palate is broad and

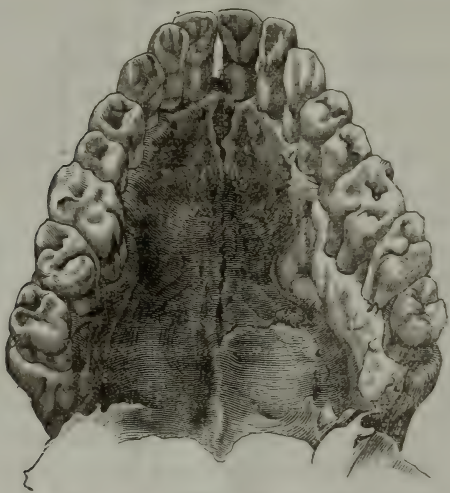
Fig. 1.



shallow, the teeth regular and well formed, as in this skull, (see figure at page 392,) and the mouth large, there is nothing to obstruct the passage of the voice, and under such circumstances it is generally clear and distinct, for upon the principle recognized in physics, that the angle of reflection is equal to the angle of incidence, the voice, as it wells up from the pharynx, constituting the incident wave of sound, strikes upon the palate, and the reflected wave meeting with no impediment, is driven directly from the mouth. When the palate is very high, narrow, and angular, and the teeth irregular, as in this skull, (Fig. 2,) the voice, of necessity, is materially affected. For here again applying the principles already referred to, the incident wave of sound impinging upon a *high*, narrow, and angular palate, is of course reflected, but in place of passing freely from the mouth it either strikes upon the alveolus or the palatine surfaces of the front teeth, and is then driven back to the pharynx. The resulting sound arising from this is of the most indistinct, muffled, and cavernous character, and almost unfits a person so constituted from public speaking. The impediment which DEMOSTHENES is said to have conquered was slight in comparison with it. The application of the principles just made no doubt has suggested itself to the minds of others, but I have never heard it expressed or met with it anywhere. It is advanced for what it is worth, and without any pretentious claims to originality, as an idea

which would naturally suggest itself to any thinking mind after observing the different conformation of the parts. The most distressing cases to speakers and listeners are those unfortunate persons who, either from congenital deficiencies or as the result of tertiary syphilis, have an open-

Fig. 2.



ing through the hard and soft palate. Thanks, however, to the application and ingenuity of Dr. Kingsley, of New York, this defect can now be readily obviated, and the speech made clear and distinct.

Speech, or articulated sound, as we have already seen, is a gift peculiar to man, and is the result of education and imitation. Division of these sounds has been made, on account of their origin and variations, into vowels and consonants. They are accomplished by the soft and hard palates, the teeth, tongue, lips, and cheeks, and it is important that these should be in a perfect condition to insure distinct articulation.

The *vowels*, A, E, I, O, U, are continued sounds, which the voice furnishes almost completely formed; as they need for their articulation little more than opening the mouth, at varying distances, by the separation of the jaws and lips, a slight elevation or depression of the tongue accompanying this in the pronunciation of some of the vowels.

The *consonants*, as their name indicates, serve to unite together the *vowels*. Their pronunciation, affected by interruptions to the passage of the air in some parts of the oral cavity, by various and complicated motions of the lips and tongue, the latter of which, when applied to the palate or teeth, narrow or close the channel for its exit, is always less natural and more difficult than the vowels. The most harmonious languages, and the most pleasing to the ear, are those which use the *fewest consonants* and the *most vowels*. The division of the letters of the alphabet

into vowels and consonants, has not been thought sufficient; but the consonants have been further distinguished according to the parts which are more especially engaged in the mechanism of their pronunciation, by the epithets dental, lingual, labial, nasal, and guttural. The special consideration of the exact action of the velum, tongue, and lips in the pronunciation of the different vowels and consonants, would involve more time than we have at our command at present; it is a subject, however, worthy of careful study on the part of the dental practitioner, and intimacy with it must impress upon him the importance and necessity of exercising the greatest care to so conduct his operations, whether upon the natural teeth or in the construction of artificial substitutes, as not to mar the speech of his patient. This would be unfortunate under any circumstances, but when occurring to one who is constantly compelled to speak or sing in public, the importance of the modification becomes immeasurably magnified. For while the improper use of the file, the inexcusable loss of a tooth, or an imperfectly constructed and badly-fitting operation, may not entirely unfit an orator, an actor, or singer, from the discharge of his duties, it is calculated to produce a modification in the speech not only perceptible to the auditory, but the recognition of that fact reacting upon the mind of the person, unfits him for the fullest development of his vocal powers.

In conclusion, it remains for us to consider the teeth in their relation to—

APPEARANCE.—This section of the subject more frequently attracts attention and excites comment on the part of ordinary observers than the portions already discussed, for even those who fail to recognize the importance of the teeth as masticatory organs, or who from physical imperfections in the auditory apparatus, or the existence of mental defects which render them incapable of distinguishing variations in sound, as a general thing at least readily notice any deviation from the ordinary appearance of the teeth. And no single feature of the face is more capable of changing the entire expression than the teeth. This is markedly evident when a classic face, which in repose excites admiration on account of the symmetry and regularity of the features and the purity of the skin, has not only the illusion dispelled at once, but a feeling of loathing induced, by a smile revealing, in place of pearls, blackened and crumbling snags; while, on the other hand, a very ordinary and homely face when lighted up by a smile which uncovers clean, white, regular, and symmetrical teeth, becomes pleasing and attractive.

It is said that the teeth of Americans are more frail, and that the prevalence of dental caries, and, as a consequence, disfigured mouths, are more common with us than with Europeans and people in other parts of the world. Writers generally, in and out of the dental profession, appear disposed to adopt this as an unquestioned fact; for my own part, however,

I am somewhat inclined to doubt the accuracy of this conclusion, for persons whose intelligence, keen perceptions, and clear judgment can be relied on, have informed me that when traveling through Europe they have paid special attention to this matter, and have found the teeth of the inhabitants of the countries through which they passed not merely as bad, but a great deal worse than Americans, for they do not pay that attention to the preservation, or restoration of the organs which is so universal with us.

Again, it is asserted, as an evidence of the physical degeneracy of our times, that the teeth of the present day are greatly inferior to those of preceding generations. This, however, is an open question, as the opinion merely rests upon suppositions and not reliable data. It is inferred, for instance, because hale and hearty parents and grandparents who have attained to a green old age, and retaining their teeth, in keeping with the general physical conformation, that all, or a vast majority of the teeth of the generations to which they belonged, were equally as good. It is much more reasonable, however, to believe that the same physical weakness and the operation of external influences which shortened the lives of millions who were born at the same period, produced the same effects upon the teeth of these millions, as we notice in those of our own day.

Unfortunately we have no exact data to go upon, so far as the universality of dental caries is concerned in the past; but the testimony of Shakspeare, that—

"No philosopher ever bore the toothache patiently,"

proves that it has prevailed to a greater or less extent in all time. With regard to preceding generations in our country, we have the testimony of Moore, who, in giving a description of a party with whom he traveled through Virginia in 1802, says of one of them:—

"What a pity, blooming girl,
That lips, so ready for a lover,
Should not beneath their ruby casket cover
One tooth of pearl!
But, like a rose by the church-yard-stone,
Be doom'd to blush o'er many a mouldering bone!"

And then adds in a foot-note, "Polygnotus was the first painter, says Pliny, who showed the teeth in his portraits. He would scarcely, I think, have been tempted to such an innovation in America."

How much of this statement is to be relied upon as truthful of that period, and what allowance is to be made for the imagination of the poet, and the disposition to satirize a people whom he neither understood nor admired, is now difficult to determine. In whatever way we accept the testimony, it is at least evident that our teeth have not become worse; but, on the contrary, it is rather to be hoped that on account of the atten-

tion which they now receive in contrast to a former period, when there were few if any skillful dental practitioners, that they have rather improved than otherwise.

To whatever extent dental caries may prevail within our own country or elsewhere, there is no face, however beautiful or homely, that is not more or less affected by the condition of the teeth; to this end therefore it is important that irregularities of the teeth should be corrected, if no other reasons existed in favor of such efforts; and that every exertion should be put forth to save the natural organs when affected by decay. For to do this is the highest order of surgery, and in all, but very rare and exceptional cases, artificial substitutes, however perfectly constructed, fail to entirely restore the lost expression. It is not enough, however, to merely save the teeth, but the aim should be to preserve, so far as it is possible, the natural form and size of the organs, and to so conduct, and construct the operations as to make the least possible exhibition of them when the patient opens his mouth. However gratifying it may be to the pride of a dentist to have his work made evident to all men in this way, if an operation or a series of operations have been accomplished at an *unnecessary* and *unjustifiable* loss of the anatomical characteristics of the teeth and a great part of their utility as masticatory organs, the work, however beautiful to look upon as a mere piece of handicraft, cannot be regarded as in the fullest sense a complete success, or as a course which should be commended or adopted by others. There are cases in which the operations, on account of the extensive ravages of decay and the portion of the tooth affected, must show. To these, of course, the remark just made has no reference.

The general appearance of the face is not merely affected by the condition, presence, or absence of the front teeth, but the hollow, sunken cheek reveals in the most unmistakable manner the loss of bicuspids and molars. The symmetry of the face in this way is frequently destroyed by the inexcusable extraction of these teeth because a proper valuation is not placed upon them as masticatory organs, and on the score of appearance, by practitioners and patients, it being supposed that, as back teeth, their absence will never be noticed. As an illustration of the effect sometimes produced by the adoption of such a course, observe this skull, in which you see that the orbit, the malar, and superior maxillary bones on the left side are very much depressed or lowered in comparison with the right side; and this, beyond a question of doubt, is due to the extraction of the left inferior molars, and must have given a very singular expression to the person during life. There are very few faces, when examined critically, in which both sides will be found symmetrical, or in harmony with each other. One side, for instance, will be round and full, and the other hollow and sunken; after making every allowance for congenital defects, falls, blows, and other accidents, in the majority of these cases the vari-

ation or deformity, for it often amounts to that, has been caused by the loss of molars and bicuspids, many of which might have been saved if their true value had been duly appreciated.

In the introduction of artificial teeth, the greatest care of course should be exercised to preserve or restore the natural appearance of the face. To do this with any prospect of success, however, it is important that the anatomy and physiology of expression should be made a careful object of study.

It is important, for instance, that the teeth should be so arranged as not to give a sunken appearance to the mouth, or to make it so prominent as to obliterate the groove or depression in the middle of the upper lip; the concavity which naturally belongs to the space between the lower lip and chin; and the lines which the action of the muscles create on each side of the mouth, extending from the wings of the nose to the corners of the lips.

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On Dentition and the Care of the Teeth. By Henry C. Quinby, Liverpool, England. A pamphlet, of 47 pages, with the above title, has been received.

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Chicago Dental Journal.

"Dental Hygiene, or how to save the Teeth from Decay. A paper read before the Chicago Dental Society. By W. W. Allport.—That many diseases can be prevented by proper hygienic regulations as easily as they can be cured by medical treatment, is a principle well established in medical science. The common axiom of medicine, that the knowledge of what a disease is, constitutes half its cure, is not more true than that in order to know how to prevent a disease we must know its cause. This knowledge no man can possess by intuition; it can be ascertained only by observation and reason. It is from facts observed, and statistics gathered, by medical men, that they have been convinced that certain diseases are produced by certain causes. We are taught by statistics that the mortality is far greater to a given number of inhabitants, and that the mean duration of life is much shorter in populous towns than in rural districts of the same climate. This shows that a city residence is much less conducive to health than one in the country. We also know that, in the crowded and filthy wards of a city, certain types of disease are much more apt to prevail, and that individuals attacked by these diseases are much less likely to recover than those who reside in the cleanly wards, with large yards surrounding their houses, where they are supplied with an abundance of pure air. Hence we are drawn to the irresistible conclusion that cleanliness and pure air are important requisites to good health, and that filth and impure air are prolific and exciting causes of disease.

"From observations often repeated, and statistics carefully collected, it has been ascertained that diseases may be engendered, not only by crowding too many persons into dark and badly ventilated rooms, but by the accumulation of filth and dirt. Whole columns of figures might be given to demonstrate the correctness of this position, but for our purpose it is hardly necessary. We will content ourselves with a single illustration.

"It is well known by medical men that, at certain seasons, typhus fever

is especially rife in densely populated and filthy parts of populous towns. Statistics show that in those parts of London where the population is one to every one hundred and eighty square yards, the proportion of deaths from typhus to the whole mortality is 131 out of 2289, or about six per cent. of the whole; where the population is one to thirty-five square yards, it is 349 out of 3428, or over ten per cent., nearly double the ratio in the less crowded district.

"It has frequently happened that places once considered unhealthy have become proverbial for the health of their inhabitants, after a proper system of sewerage and drainage has been introduced. This is especially the case with our own City of Chicago. So fully have facts of this kind been established, that the proverb, 'An ounce of prevention is worth a pound of cure,' has become a favorite maxim all over the world. Hence the willingness of all large cities to submit to almost any amount of taxation for the prevention of disease or the removal of its cause.

"These principles apply with as much force in dental as in medical science, and they have just as important a relation to the welfare of the people in the one case as in the other. It is as true of the decay of the teeth as of the many forms of disease which attack the more vital organs and demand the more immediate attention of the medical practitioner, that it is due to well-known causes—and that in this case as in the other, to prevent the disease we must remove its cause. Clearly as it seems to be demonstrated that disease is engendered by impure air and filth, we doubt whether there could be as many facts brought forward to substantiate this opinion, as can be adduced to prove that the premature decay and loss of so many thousands of teeth is induced by well-known chemical action, arising from the accumulation of filth between and around the teeth, which the patient himself can prevent, and which no one else can. Surely the proverb, 'An ounce of prevention is worth a pound of cure,' is no more true in medicine than it is in dentistry.

"And yet the above facts and principles, while they are appreciated and acted upon in the one case, are practically ignored and set aside in the other, by a large majority of people. Why should there be this difference? Is it because people consider sound teeth of no consequence? Is it because they care nothing for the inconvenience and pain caused by the decay and loss of the teeth? Is it because they are unwilling to be at any expense to secure a healthy condition of the teeth, while they readily pay thousands to preserve their general health? The very fact that they do cheerfully pay large sums to the dentist when they become aware of the necessity of employing him, is of itself sufficient to give a decided negative to all such questions.

"The truth is, that people do not fully understand the importance of *preventive* treatment in regard to the teeth; and this is because our profession has not taken the pains to enlighten and instruct them on the subject, as the medical profession has done in respect to the prevention of other diseases. We have something to learn in this respect from our brother practitioners of the older branch of medicine, and if we do our duty we have here a great work. Hitherto the dental profession has spent its energies chiefly in treating diseases of the teeth and in reaching the highest point of professional skill and dexterity. We have been content to take the patient with his teeth already diseased, sadly dilapidated, or hopelessly ruined, and to restore them to health by filling or otherwise treating them, or else remove them with as little pain as possible, and to supply their loss by the best artificial substitutes. This done,

he has been sent away deeply impressed with the idea that he has been peculiarly fortunate in securing the highest skill in the profession. No pains have been spared in putting in hard fillings and polishing them till they equal the enamel itself in hardness and finish. His teeth have been cleansed till they rival pearls in whiteness; and, with mirror in hand, he is invited to see how beautifully the work has been done. The dentist pockets his fee, and the patient departs as ignorant of the cause of the decay as when he came. But with this the work of a really good dentist does not end, any more than merely curing a sick man constitutes the whole duty of the true physician. Our desire and effort should be not only to do our work well, to restore diseased teeth to a healthy condition, or to provide the best artificial substitute, (which at best must come far short of good natural teeth,) but so to instruct our patients as to the causes of decay, and so to impress upon them the necessity of absolute cleanliness of the teeth, that the necessity of dental operations on themselves or their children may be less frequent.

"To cure disease scientifically is a high attainment of the healing art, and wins for the medical profession the well-deserved meed of public praise. To forestall disease, and thus obviate the necessity of cure, is still nobler, and when by hygienic and sanitary regulations on a large scale a whole community is saved from the ravages of disease and pestilence, it entitles that profession to the highest rewards of philanthropy. It is this higher ground of *prevention* that the dental profession is now called upon to occupy. Admirable as is surpassing professional skill, it is not enough to perform successfully difficult operations, to excel in mechanical execution, and to be able to insert a better set of artificial teeth than our next door neighbor. If we would elevate our calling to its true dignity as a public benefactor, we must, above all things, by proper instruction seek to prevent the necessity of frequent dental operations.

"What should we think of a physician who should treat successfully a large number of cases of typhus or intermittent fever, and yet, though the cause was well known and could be easily removed, should neglect to tell the neighborhood what it was, and to impress upon them the necessity of its removal? We might admire the knowledge and skill which could effect the cure, but it would be at the expense of his reputation for philanthropy. And what should we think of the medical faculty as a body, if, when they knew that a certain cause was producing a fatal epidemic and hurrying thousands to their graves, they should go on treating the cases and pocketing the fees without making any effort to spread a knowledge of the proper precautionary measures?

"Such, in a measure, is the position of the dental profession. Knowing full well the causes of the decay of the teeth, and that three-fourths of all that are lost could have been saved by being kept clean, we have been content to treat them when diseased, giving merely a little *oral* instruction to each patient, (and quite too little of that even,) leaving the public at large in total ignorance as to the importance of keeping the teeth perfectly clean.

"What now is our duty in this matter, not only as professional men, but as philanthropists? I answer—not only to give such oral instruction to those with whom we come immediately in contact as patients, but to disseminate, through popular journals and other publications, information on this subject which will arrest and fix popular attention, and convince all of the desirableness and necessity of proper care and absolute cleanliness of their teeth in order to prevent their decay."

PERISCOPE OF MEDICAL AND GENERAL SCIENCE IN THEIR RELATIONS TO DENTISTRY.

BY GEO. J. ZIEGLER, M.D.

Silicates.—"Silica, apparently so inert at ordinary temperatures, develops powerfully acid properties at high temperatures, readily displacing from combination even the strongest acids, such as sulphuric acid.

"The silicates constitute a very large number of natural minerals, which, variously intermixed or associated, compose our so-called igneous rocks. There are two classes of silicates—the anhydrous and the hydrated, or those which do not contain water and those which contain water. The anhydrous silicates are produced directly by igneous action, and the hydrated silicates are produced by aqueous, or, as I may term it, thermo-aqueous action, or, if you please, hydro-thermic action, implying the operation of water at high temperatures under great pressure.

"The silicates produced by igneous action may be directly formed by heating silica and the base together. We can make silicates without the least difficulty in this way. I have laid before you a numerous series of specimens so formed. Combination may take place without the least appearance or least evidence of fusion. That is an important point. Here is a silicate of oxide of cobalt, which is largely prepared for manufacturing purposes. It was made by mixing silica and oxide of cobalt together, and heating the mixture for a long time at a temperature very considerably below that which would suffice for the fusion of the silicate when formed. We have here other silicates so produced. When they leave the crucible they come out apparently as pulverulent as the mixture when first introduced. Here is a specimen—silica and lime heated together. It is perfectly pulverulent, and yet we know that combination has taken place, for if we apply an acid to it, the lime is removed, and the silica is separated, not in the form of sand or powder, but in the form of a jelly, which is a certain proof that the silica has been in a state of combination. There is some silicate of lime which has been treated with an acid, and you will observe there the flocculent silica which has been deposited. From this example we see that combination may take place without any sign of fusion, and this affords an example of the fallacy of the old adage about bodies not acting except when dissolved,—'*Corpora non agunt nisi soluta.*' This principle of forming silicates by exposing them to a temperature insufficient to cause fusion, is much resorted to in manufacturing operations, as, for example, in the production of certain kinds of glass. It is called 'fritting.' Supposing we have a silicate consisting of a very fusible base—oxide of lead, for example—if we heat a mixture of the components to a high temperature, the oxide of lead will melt and subside, and the surface of contact between the lead and the silica being greatly diminished, the lead will be protected to a great extent from the action of the silica. But if, on the other hand, fritting be resorted to, that is, if we keep the two bodies at a lower temperature than is required to fuse them, extensive contact is preserved, and we then succeed much better in producing such a silicate. The amount of contact is much greater than it would be if the oxide of lead were allowed to fuse and subside to the bottom of the vessel. After combination has

been effected by means of fritting, the temperature may be raised in order to melt the product.

"We come now to the consideration of the physical properties of the silicates. The most familiar examples of silicates are presented to us in the form of glass, of which there are several varieties; for instance, crown or common window glass, bottle-glass, and flint-glass—glass which contains a large amount of oxide of lead.

"We may divide the silicates into two distinct classes. There are, first, the amorphous, or formless silicates; and these, again, we divide into two classes or divisions—firstly, the vitreous or glass-like silicates; and, secondly, those which are opaque and stone-like, and are not vitreous in their aspect. The second class of silicates includes those which are crystallized.

"As I said just now, the various kinds of common glass are familiar examples of the vitreous silicates. Crown-glass and bottle-glass are silicates of soda and lime. Flint-glass, on the contrary, is a silicate of potash and oxide of lead. We have here very beautiful specimens of zinc glass, oxide of zinc in this description of glass replacing oxide of lead. In nature we find a beautiful kind of glass—obsidian. It is a black glass, which, in thin slices, is translucent, and does not exhibit much color. The colors of the glass which we produce in commerce are due to the presence of metallic oxides in small quantity. There is red glass, the color of which is due to dioxide of copper. A yellow glass has been manufactured of late, the color of which is imparted by oxide of uranium. Blue is due to oxide of cobalt; purple, to oxide of manganese; and black, to mixtures of various oxides, especially iron and manganese. There is one point in connection with black glass to which I must call attention. We have a specimen in the museum, which came out of the Exhibition of 1851, from the French department. It is an intensely black glass. M. Dumas assured me that the black color was communicated entirely by sulphur. In iron furnaces there are slags which are intensely black, and there are reasons for supposing that sulphur in certain combinations—probably as a sulphide—may communicate the black color to them.

"The next point to which I shall refer is one of considerable interest, and especially, I think, to geologists. It is the subject of devitrification, or the crystallization of glass. If we take a piece of ordinary glass—common bottle-glass, for example—and expose it for a long time to a red heat—we will say a temperature quite insufficient to melt it—it will become perfectly opaque. If we continue the heat long enough, it will cease to present the slightest appearance of vitreous character, and will be converted into a stone-like mass. In other words, it will become crystallized, or devitrified. Again, if we melt glass, and allow it to cool very slowly, the same phenomenon occurs. I have here a very extensive series of specimens, which I have collected from time to time, illustrating all these points, and they are well worthy of your examination. There is a piece of common crown-glass. When that is heated and slowly cooled, you will find that beautiful little radiated crystals will start up through the mass in all directions. These will gradually enlarge, forming globular masses, which at length will become so considerable as to occupy the whole mass. It is very beautiful to watch the changes that take place in glass of this kind. There is another specimen in which you will see a number of globular white masses, each being a series of radiating white crystals. Here again is a larger specimen. It is very curious, in the

case of bottle-glass, to see the change of color consequent on the crystallization. Here is a piece of ordinary bottle-glass which has become opaque and acquired this blue coloration simply by being heated in the manner described. This reddish-brown portion is the crystallized portion of it. It consists of large nodular masses formed of radiating crystals. Then again we find that these crystals are arranged in rows or definite layers, reminding one very forcibly of a certain kind of obsidian—Lipari obsidian. These specimens are nothing more than pieces of ordinary glass converted into a crystalline form in the manner I have described. If I were to take this piece and expose it to a high temperature, and cool it rapidly, I should get glass again just in the same state as it was before. If we take igneous rocks, pound them, melt them down, and cool them slowly, we get a mass like that—opaque and crystalline; but if, instead of cooling the melted rock slowly, we cause it to cool rapidly, we get a mass of a vitreous character. We frequently find in the slags of our furnaces that one portion of them is vitreous and the other portion crystalline. Other things being equal, that part which cools most rapidly will always acquire a more vitreous character than the other part. Hence it is, that on the outside of these pieces of slag you find a glassy appearance. Here is a very beautiful specimen of crown-glass, in which you will see crystals of large size. I may direct your attention to the case in the museum above, which contain numerous illustrations of devitrified glass. Here is another beautiful specimen—the only one of the sort I ever saw. I had it from Mr. Bontemps some years ago. It is flint-glass—silicate of potash and lead—and is in beautiful crystals.

"In this process of devitrification, there may be a simple rearrangement of particles in a crystalline form. We may, for example, have a definite chemical silicate; that silicate, if cooled rapidly, may be a glass, or, if cooled slowly, it may be a mass of crystals. On the other hand, we may have a mixture of silicates; and, on cooling, one of these shall crystallize out, producing a more or less definite crystallized silicate, and there shall remain a portion non-crystalline—a sort of 'mother-water' of glass, if I may apply that chemical phrase to this subject; and thus, when we come to examine the non-crystalline portion in certain cases, and compare the constitution of that with the crystallized portion, we find a difference. This is exactly what takes place in ordinary solutions. There is no reason why the same thing should not occur—as it dôes occur—in the case of glass. The question has been examined by Terreil. An attempt has been made to employ our basalt, occurring in South Staffordshire, along the line of the Rowley Hills, on a large scale, for manufacturing purposes. The Messrs. Chance took out a patent, some years ago, for this application of basalt. It was proposed to melt it, cast it, and then cool it; and I have seen some articles so produced—such as the lintels of doors, and so forth; but, owing to some difficulties which arose, the process was ultimately abandoned.

"Let me now direct your attention to certain accidental forms of silicates. I think there are some points in connection with this part of the subject which may interest geologists especially. Silicates are largely produced in our iron-smelting furnaces, and sometimes you will find, in looking over the cinder heaps, that these silicates are present in a variety of peculiar forms. Here is a specimen I got from Staffordshire some years ago. It is remarkably cellular, resembling honeycomb; and the cellular structure exists throughout a large mass in this instance. It

could only be formed, I think, by the elimination of some gaseous matter from every part of the slag during solidification. Then there is another form in which the slag is found—that of hair-like threads. This is some from South Wales. It is a delicate, wool-like substance. I have also some from Prussia. It is a slag of by no means uncommon occurrence. It is nothing more than delicately spun glass—filaments of glass which have been spun by the operation of the blast. The blast has, in some way, caught the slag, and spun it into delicately hair-like threads. On examination, you will find little globules of glass occurring here and there among the threads. I mention this form particularly, because nature presents us with similar products—in fact, so similar, in all respects, that if you place the two together you will hardly be able to distinguish them. I believe we have in the museum above some volcanic specimens of this sort. I will give you a statement of Dana on the subject of this capillary volcanic glass, which he observed at Kilauea, in the Pacific Ocean. 'At one of the pools, the formation of Pelé's hair, or capillary volcanic glass, was in progress. It covered thickly the surface to leeward, and lay like mown grass, its threads being parallel, and pointing away from the pool. On watching the operation for a moment, it was apparent that it proceeded from the jets of liquid lava thrown up by the process of boiling. The currents of air blowing across these jets bore off small points, and drew out a glassy fibre, such as is produced in the common mode of working glass. The delicate fibre floated on till the heavier end brought it down, and then the wind carried over the lighter capillary extremity. Each fibre was usually ballasted with the small knob which was borne off from the lava-jet by the winds.' * * *

"We now come to the subject of the fusibility of silicates. What is required to effect fusion in many cases is not so much an extremely high temperature as long-continued heat. There are some which do, of course, require very high temperatures, and which resist even the highest temperatures we can command in our furnaces.

"The silicates are sometimes excessively liquid when fused; at other times they are more or less viscous; and this is especially the case with the slags or cinders from our blast furnaces. If you examine the operation of these furnaces, you will detect a little delicate lava stream. There may be no outward sign of such a stream, the whole being covered with solid slag, but upon pushing a walking-stick through the upper portion you will render visible a little current of molten slag beneath. In these slags when melted you will occasionally find a considerable quantity of unfused and suspended matter mechanically present. In a slag obtained from our copper furnaces, called 'ore furnace slag,' you will always find a quantity of quartz diffused through the mass. Here is a sample. The quartz forms no part of the constitution of this slag, but is there simply mechanically. The presence of such matter can easily be accounted for in natural lava. A lava stream may in its course come in contact with foreign matters, take them up, and transport them to a distance, and on that account I present this specimen before you as an illustration of what occurs in nature.

"Now, with regard to the composition of silicates. We may have simple silicates, perfectly definite in atomic constitution, consisting of one single base, and silica. Of these there are two distinct classes. There is that represented by the RO base, as chemists term it. That is the base which is typified, we will say, by lime, or magnesia, or protoxide of iron,

or protoxide of manganese. And then we have the other kind of base, which is represented thus—R_2O_3, and which is illustrated by alumina, for example. We might have a silicate of lime. That would be a simple silicate—a silicate consisting of one equivalent of base and one of silica. The same remark applies with regard to the other kind of base. We have definite silicates containing each of the two types of bases. Thus, our common iron furnace slag, of which you have numerous specimens before you, consists of silicate of lime and silicate of alumina. Here is one which is a definite chemical compound—silicate of lime and alumina. It contains, however, a small quantity of foreign matter mechanically present. Then we have mixtures—and this is a point of importance—of definite silicates with each other,—not *compounds*, but simple *mixtures;* and these occur abundantly in nature. Lastly, we have definite silicates or mixtures containing foreign matter. The ore furnace slag which I exhibited to you just now is an example. This foreign matter may either be perceptible to the eye, as in the case of that slag; or it may be minutely diffused through the mass, and invisible, as it is in the case of this slag."—(Dr. Percy, *Chem. News.*)

Teeth—(Continued).—"*Of the pulp.* The *tissue* of the pulp, it must be distinctly borne in mind, is not converted into dentine; neither does dentine, nor the tissues from which it is formed, exhibit any characters which justify our classifying it with the connective tissues. It is not, however, formed independently of any of the histological elements of the pulp, as asserted by Huxley, for no dentine was ever produced except by the agency of the so-called 'cells' above referred to. I agree with Kölliker and Lent that the dentinal cells are the only active agents concerned in the formation of the dentine, but cannot regard the canals as direct processes of the whole dentinal cells, nor admit that the matrix is an intercellular substance, the '*secretion of these cells and of the tooth pulp,*' as they maintain. I have advanced already many facts against the general views regarding this so-called intercellular substance, which I need not repeat here. The assertion that the matrix is a secretion from the cells and the tooth pulp, accords with the dictum that the intercellular substance of cartilage and bone arises *partly* as a secretion from the cells, and *partly* from the blood independently of them. (Kölliker.) Such statements can scarcely be considered as hypotheses. They are mere authoritative assertions, in support of which no facts are given or arguments advanced.

"As the tooth advances in age the pulp becomes smaller. The relation of the nerves and vessels to the youngest dentine always remaining the same. The nerves may be seen in vast number, forming bundles, composed of numerous large dark-bordered fibres, which interlace freely with each other, and divide near the surface of the pulp into bundles, composed of fibres, which become finer and finer. The ultimate fibres with their oval nuclei are very freely distributed upon the surface of the pulp just beneath the large oval nuclei or cells, which take part in the formation of the dentine, and the fibres run among the prolongations of these cells. The nerves and vessels pass in a direction at right angles to the dentinal cells and tubes. The mass of the pulp is composed of a simple form of connective tissue, with numerous oval and triangular corpuscles, (germinal matter,) not unlike that of which the mucous tissue of the umbilical cord consists. There are no true fibres of yellow elastic tissue, but many of the fine nerve fibres which run in bundles of white fibrous tissue might

easily be mistaken for them. In many old teeth the pulp cavity is almost obliterated.

"*Of the formation and structure of the enamel.*—Great difference exists among observers with regard to the formation of enamel. After the tooth sac has completely closed a change takes place upon its inner surface, and a quantity of a very peculiar form of connective tissue is produced. It seems to consist of stellate cells, almost like those composing the pith of the rush, a form of vegetable tissue termed *actinenchyma.* This tissue has been well described and figured by Todd and Bowman, who regard it as composed of a web of fibres, the meshes of which contain a clear fluid. (Physiology of Man, vol. ii.) This tissue has been considered by John Hunter and by the majority of observers since his time, as an organ concerned in the formation of enamel, (enamel organ.) Upon its inner surface is a layer of elongated cylindrical cells, arranged precisely as columnar epithelium. These cells constitute the so-called enamel membrane, and it has been generally believed that in the formation of enamel the cells become calcified, and that, in fact, the prisms of enamel are nothing more than the calcified cells of the enamel organ. If this be true, it almost follows that the enamel corresponds in its position and structure to the epithelium of a mucous membrane, while the dentine must be regarded as a modification of the subbasement tissue, and the position of the basement membrane would be between the enamel and the dentine.

"It is, however, quite certain that the pulp is not more directly concerned with the formation of the dentine than the enamel pulp is with the formation of enamel. Both dentine and enamel are formed from elongated, nucleated bodies, which have been spoken of as cells. These cells, which form the matrix of the dentine, as has been shown, gradually move inward, while the pulp diminishes in proportion. The power of change resides in the germinal or living matrix of the cell itself, not in the membrane above or below it, or in any other matter.

"Professor Huxley, however, asserts that the enamel is not produced by any conversion of a cellular structure. 'The fibres of which it is composed are structureless and almost horny.' Its existence and its structure are to be considered as ultimate facts not explicable by the cell theory.* Mr. Huxley's view has not been confirmed by Mr. Tomes, (Dental Surgery, pp. 265, 270,) and I have had no difficulty in demonstrating elongated bodies, each having a distinct nucleus, the portion nearest the dentine being calcified while the greater part still remains granular. I have some specimens preserved in which the whole process can be demonstrated. These bodies are as much 'cells' as epithelial particles are 'cells.'

"Professor Huxley maintains that all the dentinal tissues are *dermic* and not *epidermic.* By the action of acetic acid he raises a membranous structure from the outer surface of the enamel, and, moreover, asserts that the cells of the so-called enamel membrane are not directly concerned in the formation of enamel, but that the enamel rods are produced *beneath* it.

"The 'membrane' thus raised by the action of acetic acid really consists of the altered outer uncalcified part of the columnar cells already described, and the 'enamel rods' seen 'beneath' it, are really the *calcified portions of these very same cells.* Mr. Tomes has, in fact, shown that this so-called 'membrane' is to be split up into columns, and rightly

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* On the Development of the Teeth, etc. *Quarterly Journal of Microscopical Science,* vol. i. p. 149. 1853.

maintains that it cannot therefore be a '*membrana præformativa*,' as it is considered by Huxley.

"The outer extremities of the prismatic calcifying cells of the enamel are of course composed of soft material. It is this superficial uncalcified portion which may be torn away from the deeper and calcified portion in the form of an expanded membrane. By the action of acids it swells up and becomes transparent, and seems to be a membrane covering the enamel rods. Mr. Nasmyth was the first to draw attention to the existence of such a membrane, which was to be demonstrated by the action of an acid, covering the enamel even when fully formed, but before it had suffered from friction. This was considered by him to be the persistent dental capsule; but Mr. Tomes has shown that this, Nasmyth's membrane, is continuous with the cementum of the fang of the tooth, and is rather of the nature of uncalcified cementum than preformative membrane.

"The elongated cells which become calcified to form the enamel rods or prisms are, however, situated entirely beneath a thin membrane, to the under surface of which the most superficial portion or summit of these cells adheres. This membrane is highly vascular, and I have succeeded in making beautiful injections of it in the canine tooth of a young pig about three months old. In the same specimen there are numerous enamel cells which are calcified in the lower part near the dentine, while the more superficial portion remains granular and still contains a very large nucleus. The enamel cell increases in length as the so-called nucleus moves away in a direction *from* the dentine. The calcareous matter is deposited first in that part of the 'cell' which is nearest to the dentine, and which was first formed, and it is deposited as small columnar masses in successive layers, which are indicated by transverse lines in the fully-formed enamel rods.

"*Of the structure and formation of the cementum or crusta petrosa.*—The cementum is often stated to be true osseous tissue, but it differs from bone in many important particulars. The lacunæ which it contains are often very much larger than those in bone, and they are most irregularly arranged. The 'matrix' of the cementum is more transparent and harder than that of bone, and much of it consists of a very clear transparent structure of a refractive power and hardness much resembling dentine, with small tubes traversing it here and there, but their arrangement is most irregular. Thin layers of cementum, it is well known, are destitute of lacunæ, but I have specimens even of the 1-100th of an inch in thickness in which not a lacuna is to be seen, and even in cementum much thicker than this very few lacunal spaces are sometimes to be found. The canaliculi are often of great length, and many are seen to extend almost in a right line from a space in the substance of the cementum quite to its surface. Nutrient fluid must be almost entirely derived from the outer surface of the cementum, and hence these channels remain as the tissue increases in thickness until the mass of germinal matter in the lacuna dies, and they are often of great length.

"It is generally stated that the cementum results from the ossification of the tooth sac, but, as remarked by Kölliker, cells take part in the formation of this tissue as in the formation of bone, and the tooth sac is not transformed into cement. The cement is continuous with the dentine, and, as observed by Tomes, the dentinal tubes may often be traced into the structure. Cementum is formed much more slowly than bone."—(Dr. Lionel S. Beale, *Dublin Med. Press.*)

Teeth, etc. of Chimpanzee.—"The chimpanzee has the same dental formula as man—viz.:—

$$i\frac{2-2}{2-2},\ c\frac{1-1}{1-1},\ p\frac{2-2}{2-2},\ m\frac{3-3}{3-3}=32.$$

"The teeth agree with those of man in some of their most characteristic features. Of the incisors, the median pair in the upper jaw, and the outer pair in the lower jaw are the largest; the upper premolars have two cusps, of which the external is the most developed; the lower premolars have two cusps united by a transverse ridge; both the upper and lower molars have the same pattern as those of man, but in a marked and exaggerated form. The teeth also present the following differences from those of the human subject: The arrangement of the alveolar arch in both jaws vastly exaggerates the peculiarity found in the lower races of man, the sides being quite parallel, or even slightly concave externally; the absolute size of the teeth is greater in the chimpanzee than in man; the upper canine especially is much larger, particularly in the male sex, where it is prominent and pointed as in the cornivora, though only used as a weapon of offense and defense, not in securing prey. The lower canine, though smaller, projects above the others of the series, and its axis is obviously anterior to the upper one, and there is an interspace to receive it between the latter and the contiguous incisor. The anterior premolars of the lower jaw present a certain declivity of the front edge, which is an approach to the very peculiar form of this tooth in the lower apes. The premolars of the upper jaw are implanted by three, those of the lower jaw by two fangs, thus presenting a considerable difference in this respect from the human subject. In their mode of wear the teeth present peculiarities observed in the lower races of men: the incisors bite directly one against the other, and become ground to a flat surface, and the outer edge of the lower, and the inner edge of the upper molars first show signs of attrition.

"In the deciduous dentition we have the essential human characters repeated, with remarkable differences of detail. The first canines are proportionally small, projecting but slightly above the remainder of the series. The pattern of the milk molars of the upper jaw is as in man; in the lower jaw, however, it differs considerably, the posterior tooth especially having only four cusps instead of five. In the order of succession there is a difference from that observed in man. The great canine, appearing to require longer elaboration, does not come into place until after the molar series is complete.

"The jaws are larger in proportion to the cranial cavity, and project more forward than in man, so that the chimpanzee is both macrognathous and prognathous. The cranio-facial angle is about 120°. The chin is entirely wanting to the lower jaw. The anterior nasal spine, which rises up from the pre-maxillary in man, is entirely absent. The shape of the palate differs from that of man; its sides are straight, being, if anything, wider behind. On the middle of its posterior border there is a spine projecting backward. The sutures between the pre-maxillary and the maxillary bone does not become obliterated till the commencement of the second dentition. The nasal bones lose their distinctness very early, but as long as they remain separate are seen to be flat and broad, and rather contracted in the middle.

"The soft palate has a well developed uvula. The tongue is very like

that of man, except that the circumvallate papillæ, instead of being arranged like a V, are like a T, with the top turned forward. The salivary caruncle beneath the tongue in the middle line is lengthened out to a point, presenting an indication of the greatly-developed 'sublingua' of the lower apes and lemurs. The stomach and cæcum closely resemble those of man in form, and there is a long vermiform appendage. The great vessels arise from the aorta in precisely the same manner as in man."—(Prof. Huxley, *Med. Times and Gaz.*)

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Salivary Glands.—"The salivary glands appear first in the insect family, principally in such as subsist on juices or animal fluids, and are distinguished by naturalists as suctorial insects. The organs consist of delicate tubes which lie in the nutritious fluids of the animal, and elaborate the salivary secretion from them, and may open either into the œsophagus or mouth. In both the flea (pulex) and bedbug (cimex) they correspond in number to those of man. That this secretion in many is subservient to other purposes than digestion is doubtless true, possessing as it does irritating properties as are seen to follow the bites of mosquitoes and gnats. These glands are absent in fish; the medium in which they live will furnish the reason for this. They are present in reptiles, and in the case of turtles, lizards, and some others, curiously combined with the tongue, consisting of closely associated and communicating tubes resting on the muscular element of the tongue. In serpents these glands are connected with the gums, and their excretory ducts at the base of the teeth. In birds they consist of crypts or follicles in the mucous membrane of the mouth, and in certain individuals of this class the ducts open under the tongue."—(Dr. D. Hayes Agnew, *Med. and Surg. Report.*)

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Signs of Dangerous Intoxication from Anæsthetic Agents. — "M. Simonin, in treating on the collapse of the circulatory and respiratory organs during the employment of anæsthetic agents, states that the two most important points to be observed are the insensibility of the temporal regions and the narcotism of the masseter muscles. In speaking of the peripheric insensibility resulting from the inhalation of anæsthetic agents, and from their use *per anum*, he says that all parts of the periphery of the body do not become insensible at the same moment: thus it takes several seconds before anæsthesia is produced on the skin of the forehead and the temporal regions, and several minutes to produce the same result on the skin of the hands and the feet. The time which elapses between the narcotizing of the extremities of the limbs and that in which the skin of the frontal and temporal regions ceases to react is rather longer, when, instead of the vapor of chloroform, the patient inhales that of ether. This time is longer still, when ether is introduced *per anum.* To discover in time the anæsthesia of the various parts of the periphery of the body, the action of the anæsthetic agents must be decreased, and punctures be made on the different parts above mentioned, about every ten seconds or oftener. The disappearance of these phenomena takes place in an inverse order to that of their appearance. With regard to the action of the same agents on the muscular system, M. Simonin opines that the contraction of the masseter muscles appears last of all during the excitation of the muscular system, often when the rest of the system is relaxed. This local rigidity is the indication of a very near collapse of all the organs, especially those of the circulation and respiration. Anat-

omy points out the cause of these facts, and the explanation shows the importance of their observation during anæsthesia. It is the fifth pair of nerves which gives sensibility to the skin of the temples; it is the same pair which furnishes ramifications to the masseter muscle. This fifth pair arises from the lateral and anterior part of the medulla oblongata, and as soon as the parts to which it distributes itself, either the organs of sensation or of movement, show the commencement of narcotization. The movements of the respiration and circulation soon become disturbed, for the vital point is in its turn about to be influenced. The author also remarks that the sensitive action of the nervous filaments pertaining to the skin is extinct before the motor action ceases. This normal absence of synchronism shows that there is no reason to be uneasy even when the sensibility of the temples ceases to exist. This is an important fact, and is the result of researches made at Nancy, where it was shown that subcutaneous anæsthesia did not exist anywhere so long as sensibility remained in the temples. To this rule M. Simonin only found one exception during sixteen years' observation. In many cases collapse of the masseter muscles may be seen without life being compromised; uneasiness should, however, arise in the mind of the practitioner with this last period of muscular insensibility. The permanence of muscular rigidity which the contraction of the jaws produces is a favorable physiological limit, which he must try not to overstep, whenever the opening of the mouth is not one of the conditions of the operation to be performed. Trismus has always reassured the experimentalist, when several other symptoms of profound intoxication during anæsthesia have alarmed him. It is thus important to ascertain the disappearance of sensibility in the temporal regions, and to be assured of the state of the elevating muscles of the lower jaw, since the observer has then under his eyes, and with the greatest ease, the course of the progress of the intoxication of the medulla oblongata, and in the generality of cases, while ceasing to employ a poisonous agent, he has often the power to prevent the last and dreaded phases of anæsthesia—namely, collapse of the circulation and of the respiration—in a word, death."—(*Revue des Sociétés Savantes* and *Brit. and For. Med.-Chir. Rev.* and *Dub. Med. Press.*)

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"*Enchondromatous Tumor under the Lower Jaw.* (Under the care of Mr. T. Carr Jackson, Great Northern Hospital.)—C. N., aged forty-three, admitted September 17th. She has good health, and there is no history of tumor or cancer in her family. Five years ago considerable violence was inflicted upon the left lower jaw in a futile effort to extract a tooth. Ten days afterward another attempt was made. Two years since, she first perceived a small hard lump beneath the lower jaw on the left side, which increased but little during the first twelve months of its existence, and was not painful. Applications were made with a view to its dispersion, having, however, the contrary effect, for it became very painful, gradually enlarged, and in December last somewhat rapidly increased to its present size.

"On admission, a tumor was found under the left horizontal ramus of the jaw, of about the size of a walnut, and occupying the digastric space; it was oval in shape, had a smooth surface, and was freely movable, having no connection with the jaw or surrounding parts. On passing the finger deeply into the floor of the mouth, and pressing the tumor from without, its deep surface could be felt possessing similar characteristics. The integument covering the tumor was healthy. The patient being very

anxious to be quit of it on account of the pain it gave her, Mr. Jackson decided on its removal. Accordingly an incision was made over it parallel with the jaw, and the skin reflected from it on either side, care being taken, in effecting this, to keep the knife close upon the tumor; it was then detached from the surrounding parts. No hæmorrhage attended the procedure until the last stroke of the knife separated it from its remaining attachments, when a profuse gush of arterial blood spurted forth. Two large arteries were secured—probably an enlarged facial and its submental branch. These ligatures did not separate until the twelfth day. The wound was entirely healed in three weeks, leaving a linear cicatrix, barely perceptible, and hidden in the flexures of the skin. The tumor —of the size of a walnut, oval, smooth, firm, and elastic, measuring $1\frac{1}{8}$ in. by $\frac{3}{4}$ in., and distinctly encapsuled—consisted of cartilage cells, nuclei, clear intercellular substance, a small quantity of non-elastic fibrous tissue, and some osseous deposits."—(*Lancet.*)

"*Hypertrophy and Prolapsus of the Tongue in a Child, producing Deformity in the Lower Jaw; removal with the Ecraseur.* (Under the care of Mr. Paget, St. Bartholomew's Hospital.)—Hypertrophy of the tongue has been met with by various writers, who have published their cases and mode of treating it. In this country it is rarely seen, but several well-marked examples have been recorded, especially in the thirty-sixth volume of the Medico-Chirurgical Transactions, by Dr. Humphrey, of Cambridge, Mr. Hodgson, and Mr. Teale. The subjects of all these cases were female children. In a former 'Mirror' (the *Lancet*, vol. ii. 1856, p. 597) we recorded a case of tumor of the tongue which appeared to be an hypertrophy of the muscular structure. When such is the case, as in Mr. Paget's patient, the primitive fasciculi are found to divide in a dichotomous manner, and, if carefully traced, these are found to terminate in very slender branches.

"On the 20th of February, a little girl, about three years of age, was brought into the operating theatre of St Bartholomew's Hospital with hypertrophy and prolapsus of the tongue, which commenced when she was some six months old. It now protruded nearly two inches, and hung downward, completely filling the circle of the lips; its end was dry, and excoriated with hardened epithelium, a sort of crust having formed of the size of a shilling; several of the papillæ also were enlarged, and in places gave to the tongue a warty or granular appearance. The lower jaw had already begun to be deformed, and expanded downward and outward; the teeth were gradually separating from one another in the mental portion of the jaw; and there was dripping of saliva. An examination of the tongue by Mr. Paget showed that the organ was truly hypertrophied, and the part not prolapsed completely filled the cavity of the mouth.

"Chloroform was carefully given to the child, and the chain of an ecraseur was passed around the tongue within the mouth, the jaws being kept open by a metal gag. The chain was slowly drawn home, and the prolapsed and hypertrophied portion was detached with little or no bleeding.

"On examination of the piece removed, its structure was found to be similar to that of the natural organ both in texture and color; it was simply a redundancy of growth, from hypertrophy.

"The subsequent progress of the case has been most satisfactory, and a good recovery has taken place."—(*Ibid.*)

"*Swallowing of Gold Plate, with Teeth attached.*—Dr. Voss presented to the New York Pathological Society a gold plate, with teeth attached, which had been swallowed by a woman during sleep, having remained in her throat for three and a half months. The patient was forty-seven years old, and stated that during a night of last summer the accident occurred. She awoke with symptoms of asphyxia and vomiting, but the foreign body could not be dislodged. She found that her voice had gone. Several physicians saw her, and, as the result of several examinations of the throat, had come to the conclusion that the lady had been mistaken as to the cause of her difficulty. Before Dr. Voss saw her the patient consulted Dr. Simrock, and demonstrated to him the presence of the foreign body in her throat, by introducing the probang herself, with the head bent downward, the body being in a stooping posture. She succeeded by this manœuvre in striking metal. Dr. Simrock then brought the patient to Dr. Voss, who, by the same means, was likewise convinced of the presence of some foreign body which had lodged itself in the neighborhood of the larynx. Dr. Simrock made a laryngoscopical examination, but could see nothing save a paralysis of the left side of the glottis. The patient was subsequently anæsthetized, and the foreign body was withdrawn from the fossa navicularis by means of a small curved and blunt-pointed lithotomy forceps. When she awoke she felt immediately relieved. She regained her voice and ease of deglutition, and three weeks subsequently the laryngoscope discovered that the right side of the glottis had returned to its normal condition. It seemed at first remarkable that the probang should pass readily into the stomach, without encountering the least obstacle, but this was explained by the fact that the plate, which was a very small one, was tucked away in such a manner that the convexity of the body fitted into the concavity of the fossa.

"Dr. Conant referred to a case presented by Dr. Clark, about three years before, where a man had swallowed a set of false teeth which lodged in the œsophagus, and ulcerated through into the pericardium, causing death by pericarditis.

"Dr. Garrish cited the case of a boy twelve years of age who, while playing ball with a button in his mouth, suddenly swallowed it. The foreign body remained in the larynx for a period of ten months, when Dr. Garrish removed it by opening the thyro-hyoidean membrane. He believed that this practice was preferable to the persistent search for suspected foreign bodies."—(*Am. Med. Times.*)

"*Growth of Bone.*—M. De Lamballe appears, in the course of his extensive researches on the generation and reparation of tissues, to have corroborated the assertions of M. Flourens. 1. That the bones increase in thickness by external and superimposed layers. 2. That they increase in length by the addition of terminal layers arranged in juxtaposition. 3. That proportionally as the new layers are deposited externally, the older ones on the inner surface are resorbed. 4. That ossification consists in the regular and successive conversion of periosteum into cartilage, and of cartilage into bone."—(*Popular Science Review*, and *Med. and Surg. Rept.*)

Regeneration of Bone.—"M. Ollier, of Lyons, communicates to the *Société de Chirurgie* some additional results of his interesting investigations on the regeneration of bone. Although the fact of this regeneration has now been definitely acquired and appropriated by surgical science,

yet such regeneration does not take place in all bones in the same manner, being more constant, easy, and rapid in the long than in the flat and the short bones. One general and essential condition of the regeneration is the preservation of the periosteum, hundreds of experiments and observations having shown that this will not occur when this membrane has been completely removed. The reproduction of the diaphysis of long bones is admitted by all; but M. Ollier's preparations show that the epiphyses are no less truly regenerated, although a much longer time is required. The regeneration of the flat bones has been wrongfully denied; for by means of the external periosteum derived from the frontal bone, M. Ollier has been enabled to construct a new nose possessed of complete osseous solidity; while the internal periosteum of the cranium, the dura mater, has in his experiments also given rise to ossification. Again, the mucous periosteum of the nasal fossæ, palate, etc. will also produce osseous substance; but to do this it requires a long space of time, as five, six, seven, or eight months, before the reproduction takes place.* The short bones may also be reproduced, M. Ollier having succeeded with the calcaneum, cuboid, etc., in animals. In all these regenerations the new bone sometimes acquires greater dimensions than the original bone. M. Ollier has never found in the course of the operations of resection, or bony extirpation which he has performed, any practical difficulty in preserving the periosteum—not even in the case of bones with anfractuosities like the jaw. The conditions under which regeneration becomes possible are the youth, good constitution, and favorable hygienic condition of the patient; and the thickness, resistance, and adhesion of the periosteum to the osseous tissue. In cachectic or scrofulous subjects the regeneration takes place imperfectly or not at all. The thickness and resistance of the periosteum constitute a most important sign as to its reproductive power, and the condition of the membrane will accurately indicate beforehand whether success, and what amount of it, is likely to attend the operation. The general conclusion M. Ollier arrives at is, that not only is osseous regeneration possible in man, but that it takes place more easily in him than in animals."—(*Med. Times and. Gaz.*)

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Concussion of Nerves.—This subject is of great practical importance to the dentist, for there is no doubt that much disorder of the teeth is occasioned by mechanical disturbance of their functions. The following from the *Amer. Med. Times* is therefore not only of interest *per se*, but also instructive in this connection: "PROFESSOR WILLARD PARKER'S 'Practical Remarks on Concussion of the Nerves,' published in the *New York Journal of Medicine* for September, 1856, is the only monograph on this subject with which we are acquainted. In this paper he gives the histories of six cases of local concussion of different nerves, in each of which the functions of the organs supplied by these nerves were permanently damaged. Prof. Parker says: 'Analogous to concussion of the nervous centres is what I shall term concussion of the nerves. A number of cases have come under my observation which I cannot otherwise explain than on the supposition that the nerve receives a shock, and the function is for the time suspended. Whether from actual lesion of its tissue, or a disarrangement of its molecular structure, I cannot decide. Moderate exercise

* This time may, doubtless, be very much shortened and ossification greatly accelerated by the free administration of calcareous substances, as, for instance, the saccharate, phosphate, and other preparations of lime —Z.

seems beneficial, but when the limb is pressed into active service it has seldom failed to become speedily and decidedly worse. There seems from this circumstance to be a loss of the nervous power of the limb, or an impairment of the integrity of the nerves supplying it. The consequence of this condition is, that the limb emaciates, the muscles are more or less atrophied, and the limb becomes permanently incapable of its former usefulness. The proper treatment is rest, alternating with passive exercise, dry friction, and improvement of the general health.'"

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"*Ossification of Nerve Cells.*—Calcareous transformation of the sheaths of vessels, or of the connective tissue, is not unfrequently found in the brain; but a similar condition of the nerve cells is rarely met with. This alteration was found by Professor HESCHL in a young man aged 26, affected with melancholia, who died in the lunatic asylum at Vienna. On the convex surface of the left anterior lobe, there was a whitish osseous patch of the size of a lentil; a portion of the gray substance was transformed into a small filamentous mass, of the size of a bean, and charged with a reddish serous fluid. The brain was much injected, and its membranes were adherent at several points by small whitish concretions. The small hæmorrhagic mass, on examination, was found to consist of vessels having partially undergone fatty degeneration, and of connective tissue loaded with pigment. Its walls had a grayish color, and were firmer than the remaining cerebral substance. Several rather extensive groups of nerve-cells, comprising this indurated portion, were ossified, some entirely, others partly. Some were transparent, and presented large round or oval nuclei; while others were entirely opaque, and charged with calcareous matter. This was readily dissolved out by hydrochloric acid, without any escape of gas. The calcareous deposit (phosphate of lime) was present also in the branches which connected the cells one to another."—(*Osterreich. Zeitschr. für Prakt. Heilk.* and *British Med. Journal.*)

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"*French Cement.*—This cement, composed of lime and India-rubber, is very valuable for mounting large microscopical preparations. The principal advantages are—that it never becomes perfectly hard, and thus permits considerable alteration to take place in the fluid contained in the cell without the entrance of air, and it adheres very intimately to glass, even if it be perfectly smooth and unground. If a glass cover is to be affixed to a large cell containing fluid, a small piece of the cement is taken between the finger and thumb and carefully rolled round until it can be drawn out into a thread about the eighth or tenth of an inch in thickness; this is applied to the top of the cell, before introducing any fluid, and slightly pressed down with the finger previously moistened. It adheres intimately. The preservative fluid with the preparation are now introduced, and the cell filled with fluid, which, indeed, is allowed to rise up slightly above the walls. The glass cover, rather smaller than the external dimensions of the cell, and slightly roughened at the edges, is to be gently breathed upon, and then one edge is applied to the cement, so that it may be allowed to fall gradually upon the surface of the fluid until it completely covers the cell, and a certain quantity of the superfluous liquid is pressed out. By the aid of any pointed instrument a very little cement is removed from one part, so that more fluid may escape as the cover is pressed down gently into the cement. The pressure must be removed very gradually, or air will enter through the hole. A bubble of air entering in this manner may often be expelled again by pressure, or it may be driven

out by forcing in more fluid through a very fine syringe at another part of the cell, but it is far better to prevent the entrance of air in the first instance. The edge of the glass cover being thoroughly imbedded in the cement, the small hole is to be carefully plugged up by a small piece of cement, and the cell allowed to stand perfectly still for a short time, when it may be very gently wiped with a soft cloth. The edges of the cement may be smoothed by the application of a warm iron wire, and any superabundance removed with a sharp knife. A little Brunswick black or other liquid cement may be applied to the edges for the purpose of giving the whole a neater appearance. The cement is made as follows: A certain quantity of India-rubber scraps is carefully melted over a clear fire in a covered iron pot. When the mass is quite fluid, finely powdered lime, having been slacked by exposure to the air, is to be added by small quantities at a time, the mixture being well stirred. When moderately thick, it is removed from the fire and well beaten in a mortar, and moulded in the hands until of the consistence of putty. It may be colored by the addition of vermilion or other coloring matter. This cement answers well for fixing on the glass tops of large preparation jars, but if moderately strong spirit be used a little air must be permitted to remain in the jar."—(*From "How to work with the Microscope," by* LIONEL S. BEALE, *Chem. News.*)

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"*On the Alloys of Silver and Zinc.* By M. PELIGOT.—In consequence of the increasing scarcity of silver money in France, which is constantly disappearing from circulating on account of the continued rise in the value of the metal, the French Government is about to lower the standard of the silver coinage by the addition of about 7 per cent. more copper. The new money will be made of an alloy consisting of 835 parts silver and 165 parts copper. M. Peligot is chemist to the French Mint, and he has made experiments to ascertain how the introduction of some zinc or the complete substitution of zinc for the copper would affect the alloy. He has found that alloys of the legal standard in which part or the whole of the copper was replaced by zinc are remarkably malleable, and when rolled are perfectly homogeneous. They are of a beautiful white color, but the binary alloy of silver and zinc is somewhat yellowish. The fusibility of the zinc alloys is greater than the copper; they are very sonorous and elastic, and if made brittle by hammering, the malleability is restored by heating. The study of the atomic alloys showed curious results. Equal equivalents of silver and zinc, or two equivalents of silver to one of zinc, gave malleable alloys, while the compounds $Ag+2Zn$ and $2Ag+3Zn$ are too brittle to be rolled. As a matter of economy, the author recommends that his goverment should employ zinc to reduce the value of the present money, the price of zinc being only one-fifth that of copper. Another recommendation to the zinc alloy is the fact of its blackening less readily with sulphuretted hydrogen than the copper compound, copper, indeed, seeming to increase the discoloration. An alloy of 800 of silver and 200 of zinc will keep its whiteness in a solution of a polysulphide, which will rapidly blacken the legal alloy of copper and silver. This, as the author points out, will be useful information to the makers of jewelry. The absence of verdigris under the action of acid liquors is another advantage. In conclusion, the author mentions a fact of no great importance to us, namely, that the introduction of zinc into money is nothing new. French copper money contains one per cent. of

zinc, and the small coins of Switzerland contain zinc, silver, and nickel."—(*Chem. News.*)

"*Cleaning of Chemical Ware.*—As will be found noticed in the *Report of Progress of Pharmacy* of the last volume published by the American Pharmaceutical Association, the bran from common buckwheat has been recommended by Nathanson, of Wilejka, for cleaning glass and other chemical ware from fat, balsams, and like adhesive matter, for which purpose it appears even better adapted than alkali, and especially for narrow-mouthed flasks. Where the substance is resinous or adheres very firmly and is quite hard, the vessel should first be rinsed with hot water. Some water is then left in the vessel and a sufficient quantity of bran thrown in, and the whole shaken together. It is remarkable how rapidly the impurities, and even the odor of such substances as copaiba are removed by this simple agent."—(*Am. Drug. Circ.*)

"*Hardening Dentists' Models.* By Dr. Hayes.—Dentists' models are *not* rendered hard with *varnish.* The following plan will produce a model as hard as stone. Mix your plaster as quickly and stiff as possible, shake it well down into the mould, let it stand at least six hours before taking it off, which operation must be performed by dry heat, (on no account by hot water.) Melt together in a pipkin eight ounces of wax (white or yellow) and one ounce of rosin. When it boils, insert a bradawl in reverse, and hold the model in it for a minute or two."—(*Chemist and Druggist.*)

BIBLIOGRAPHICAL.

The St. Louis Med. and Surg. Journ. Bi-monthly. Edited by M. L. Linton, M.D., and M. W. White, M.D. Jan. and Feb. Three dollars per annum.

We are pleased to renew our acquaintance with this sterling periodical, the publication of which was suspended in consequence of the war. We hope its future may be prosperous and uninterrupted, especially by such an infamous rebellion as the present, which happily promises to be so effectually subdued that no one will ever again be tempted to raise a parricidal hand against our National ensign, now, fortunately, more than ever, the standard of universal freedom and civilization.

Laryngoscopal Medication, or the Local Treatment of the Diseases of the Throat, Larynx, and Neighboring Organs, under Sight. By Louis Elsberg, A.M., M.D. From papers read before the Am. Med. Ass., etc. New York: Wm. Wood & Co. Pamphlet, pp. 38.

This monograph is, as its title indicates, addressed more to the physician than dentist, though containing matter of interest to the latter. It treats of the various instruments and methods adopted to relieve a class of very troublesome disorders formerly not easily brought under direct observation or subjection, and affords much useful information.

People's Journal of Health. Monthly. Edited and published by Justin Hayes, M.D., and C. R. Blackall, M.D. Chicago. One dollar per annum in advance.

The object of this magazine, to disseminate information respecting the laws which govern, and the means of preserving health, is a good one and worthy of encouragement. It presents, in a popular style, matter of practical value to the people.

THE

DENTAL COSMOS.

NEW SERIES.

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ORIGINAL COMMUNICATIONS.

PRACTICAL HINTS.

BY J. D. WHITE.

Prevention of Toothache.—Some operators, when excavating a cavity of a tooth, do so with great care *not* to expose the pulp. This is all very well if such danger were due to inadvertently or incautiously exposing it by removing *sound* tooth-bone; but we mean if all the decay can be removed except a portion immediately over the pulp, it is considered an *achievement.* Now this we regard as error. A nerve is exposed as soon as the decay has destroyed the vitality of the dentine covering it, or has in any way disorganized the anatomical structure of that substance, even though we cannot detect the change by the excavator; and in some impressible temperaments the pulps in the latter class of cases become inflamed in a short time. Such is the case with some patients for whom we are now operating. We have on several occasions removed the decay, and believed that the thin stratum remaining was sound; the teeth have been plugged, and in a few days or weeks the patients would return in suffering, and, on removing the plugs, sometimes we would find the pulps exposed, or the dentine so changed in its structure that it was obvious to the touch of the instrument, and the cases would require treatment as if the patients had suffered before the plugging. These patients are generally *neuralgic temperaments;* they have periodical attacks of pain and undue sensibility of the whole system, and especially of the head and face; and at such times we do nothing but endeavor to keep the teeth quiet by the application of creosote, morphia, or tincture of aconite root. What would be the use, in such cases, to expect a deposition of dentine to more securely protect the pulp from inflammation, and consequently pain? These cases may be set down as anomalies, and cannot be regarded as true of the majority of patients. Cases do occur, on the other hand, in cool and *nerveless* patients, where the *earthy* constituents predominate, that a very thin portion of dentine is left, and the cases do well. And

they also are *exceptions* to the rule in practice. In both of these classes of cases it is necessary to instruct the patients to keep the dentist informed in regard to the case if pain should set in, to avoid prolonged and unnecessary suffering.

A case occurred a few months since of a young lady who had a left superior first molar plugged. It became painful; the pain was of a lancinating character and periodical. Her dentist declared that the pulp was not exposed when the tooth was plugged, and, as it looked well, that nothing ailed it, and it must be neuralgia. We removed the plug, and found the pulp partially decomposed. The tooth was treated, and is comfortable. We have had many cases of this kind from the same dentist. He seems to insist that when a tooth is plugged, if all the *mechanical* part of the operation is done with care, and the plug looks well, the case must be *a success*, and he has nothing further to do with it. If a tooth is plugged when the cavity is large, it must be regarded as a *sick patient*, and may require attention at any time, and it is the duty of the dentist to act when pain sets in.

Now, if these cases are constantly besetting our way, what must be the consequence of leaving decay in a tooth over a pulp, or when we know that the dentine is disorganized? Why, it is to get into a sea of trouble, especially if we attempt to bring all classes of patients into the same line of practice. We know that it is difficult sometimes to decide whether a pulp is exposed or not. In such cases we are in the habit of applying a small quantity of creosote and waiting a day or two, to examine the case again; and we can often decide, by so doing, better than at the first examination. The creosote acts upon the decomposed dentine, so that we can better decide which is sound and which is not. Sometimes we apply the creosote several times, in order to enable us to excavate, without exciting as much pain as would be caused without it, especially in young patients. We never plug over a nerve when we know it is exposed; it is hazardous and entirely unwarrantable, and should be condemned by every sound practitioner. If we cannot decide whether a pulp is exposed or not, as is sometimes true, or the tooth cannot, from tenderness or want of time on the part of the patient, be properly cleansed, we place in it a temporary filling. The least objectionable filling for such purpose is "Hill's stopping." Although applied by heat, it is of a very low grade, and does not endanger inflammation; besides, it is not a good conductor, and the tooth is freer from the impressions of cold or hot substances taken into the mouth; so, if the pulp is nearly exposed, it is not so likely to become inflamed by sudden transitions of temperature; and if it be exposed below a stratum of *partially* decomposed dentine, reparation of the structure can take place or secondary dentine can form, if such thing *ever does occur* under a plug, better than when under a good conductor, as all metals are; and besides, there is no deleterious influences exerted by oxidation, as is the case when the baser metals are used. It

might be said, why not use gold in such cases, which is free from oxidation? Simply because it requires too much pressure to make it as impervious as the Hill's stopping, and it is a good conductor. The more gently the parts can be handled or *dressed*, at such critical point, the greater the chances are for recovery. As we closely approximate the pulp, the dentine is yielding and highly organized, especially in young teeth of whatever class. And therefore a hard metallic filling is objectionable.

Again, there is no filling as easily removed as Hill's stopping; and if the pulp becomes inflamed in such cases, and the tooth becomes extremely tender to the touch before the patient applies, or has an opportunity to apply for relief, it is much more difficult to remove a metallic filling, especially the amalgams or metallic compounds.

Notwithstanding all the care we are capable of exercising, we find nerves become inflamed under plugs when we have thought all was safe, and the plugs have to be removed and the pulps treated; and by far the most aggravating cases occur when the teeth have been filled with amalgam, "Wood's" metal, or oxy-chloride of zinc. Indeed, we regard it as the most reprehensible practice of the present day to plug a tooth in which it is at all doubtful whether the pulp is exposed or not, or is liable to inflammation, with either of these substances; and it would seem, from the plastic character of these articles, that their use is invited especially in those cases where their employment is most objectionable. This is doubtless because no consideration is given to the fact that these substances become hard in time, so that they cannot be handled when the most delicate manipulations are necessary, as when the patient applies in extreme suffering, and the tooth can scarcely be touched at all. The employment of these metallic compounds and amalgams, coupled with the many attempts to "*save*" nerves "alive," as it is called, or obtain a deposit of "*secondary*" dentine or "ossification" of the pulp, exposes patients of the present day to a vast amount of suffering which might be avoided.

(To be continued.)

FORTUNATE ESCAPE.

Dr. S. G. Martin, of Syracuse, says that he made an engagement some weeks since to administer nitrous oxide gas to an elderly lady, for whom he was going to extract some teeth preparatory to making an upper set; but fortunately, as it turned out, the teeth had to be extracted without the use of the gas in consequence of the failure of an assistant to have it ready. The next day the lady was seriously ill with congestion of the lungs, and barely escaped death.

The congestion would have been attributed doubtless to the effects of the gas had she taken it, and that she did not, may be set down as a fortunate accident for the doctor. *

GREAT CENTRAL FAIR.

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1 case general operating instruments	$56 00	
1 " minor " "	19 00	
1 " pocket " "	25 00	$100 00
D. W. Kolbe.		
1 case surgical operating instruments	75 00	
1 surgeon's pocket case	25 00	100 00
J. H. Gemrig.		
1 case surgical instruments	40 00	
1 " eye "	60 00	100 00

SNOWDEN & BRO.

1 pocket case of instruments, A.	32 00	
1 " " " B.	30 00	
1 " " " C.	22 00	
1 " " veterinary instruments	16 50	
3 " " for medicine, 1, @ $3 00	9 00	
6 " " " " 2, @ 2 50	15 00	
2 " " " " 3, @ 2 00	4 00	
4 " " " " 4, @ 1 75	7 00	
2 knives for cutting corns, @ $3 00.	6 00	
1 Fahnestock's tonsil instrument	5 50	
3 conversation tubes, @ $1 50	4 50	
		151 50

JNO. F. KUEMERLE.

1 operating case		25 00

A. H. WURTZ.

12 6-oz. Britannia syringes, @ $1 00	12 00	
6 8-oz. " " @ 1 25	7 50	
4 16-oz. " self-syringes, @ 2 50	10 00	
		29 50

LOUIS V. HELMBOLD.

1 operating case		25 00

J. J. TEUFEL.

1 surgical instrument case		65 00

GEO. P. PILLING.

1 eye syringe, 2 pipes	10 50	
1 syringe, 2 "	5 50	
2 " 1 " @ $4 50	9 00	
		25 00

F. C. LEYPOLDT.

¼ doz. horse lancets	5 22	
¼ " " "	4 50	
¼ " silver bladed button lancets	7 00	
¼ " brass button "	3 00	
¼ " scarificators	10 00	
¼ " "	9 75	
1/6 " German silver scarificators	7 66	
1/12 " temple "	3 00	
		50 13

C. J. BOULTER.

1 doz. assay muffles		6 00

DR. A. ROBERTSON, Wheeling, W. Va.

1 book on Extracting Teeth	1 50	
1 doz. tooth-wash	3 50	
		5 00
Delivered to Craig D. Ritchie, of the Miscellaneous Department		$682 13

RECAPITULATION.

Cash	$1665 25	
Instruments, etc. delivered to Craig D. Ritchie, of the Miscellaneous Department	682 13	
Berlin Castings from Mrs. Samuel S. White	411 00	
One-half the proceeds of three oil paintings by Dr. V. M. Swayze, of Easton, Pa., to be sold at the Fair.		
		$2758 38

SAMUEL S. WHITE, *Chairman*.

TEMPERAMENT.—No. 1.

BY WM. H. ATKINSON.

Read before the New York Society of Dental Surgeons.

UNIFORMITY and definiteness of meaning are essential prerequisites to enable us to make intelligent usè of terms.

Probably no two writers use the temperaments in the same sense in their efforts to designate the constitution of the person described, and hence contradictions and disagreements abound among physiologists and anthropologists.

Temperament, strictly construed, means the *domination of certain organic affinities for the* TIME.

This may, in a sense, run through the whole life of the individual, or it may vacillate, according to circumstances of food, society, and habits, natural or acquired.

The lower the numerical strength of the combination, the more likely is the body to remain under the dominion of that particular temperament through life; and the higher the range and more complicated the mixture, the greater is the liability to alternations of domination of separate organic tendency.

Thus a full measure of the bilious, sanguine, nervous, and lymphatic, combined in one individual, will be likely to have the sanguine and nervous predominate in early life, the sanguine and bilious in middle life, and the lymphatic in later years.

Full measures of two or three temperaments, with a fraction of a third or fourth, is more common than examples of complete quadruple combinations.

That which constitutes temperament has its inception and immediate resistance in the blastema out of which bodies are developed; but a predominance of the arterial system in the body after it is formed, is the proof or indication to the examiner of the existence of the sanguine temperament. And so of each of the others. Predominance of veins and glandular structures marks the bilious; a like preponderance of nerve tissues, the nervous; and of lymph, the lymphatic temperament.

Until the elements of organization are familiarly known, we shall be at a loss just how to accurately calculate their admixtures, and thus correctly define their temperaments.

There are minor indications which contribute to determine to what division to designate organizations under examinations. These are size and grade of tissues, color, etc., which are liable to lead astray, if not properly weighed in accordance with the general or predominating states in these respects. For instance: light complexions are said to be indices of the nervous and sanguine modes of combining the body; whereas the

truth is, some of the best examples of a true bilious temperament are very light, or rather red in complexion, and possess coarse and abundant sandy or red hair, and great endurance, both mentally and physically. And, on the other hand, many persons of dark complexion are extremely finely organized, nervous, and even strongly tending to loose scorbutic or scrofulous constitutions; whereas the general rule is to find toughness and strength to endure in the ratio of the depth of shade of complexion. So that it becomes a matter of special education to read temperaments with even tolerable accuracy.

Without osseous, muscular, glandular, vascular, nervous, and dermal structures we can have no body to determine of what combination or temperament it is.

Doctrines of temperaments necessarily accord with the degree of advancement in physiological attainment, and hence will gradually be growing out of the old and confined rigidity of small range of functional activity.

So soon as a body shall have arrived at perfect development of all its tissues, we shall be unable to designate its functional status by any term signifying predominance of any one set of tissues or organs, and shall have arrived to that perfection of admixture or combination as to insure a perfectly harmonious and equal play of all the functions of the entire body. Such a condition would be properly called a harmonious temperament, under whose reign we would have, could have, nothing short of absolute health. And then we should have instinctually attained the object of all knowledge, viz., instant and complete spontaneous obedience to the laws of organization. This attained, we shall be ready to begin to live in accordance with the full programme and benevolent intent of the plan of our creation.

If, then, the subject of temperament take such deep hold on the very elements of being, does it not deserve our deepest research and profoundest investigations to ascertain in what it consists? and also to determine predominating subordinate or parallel presence of these latent or active energies of diverse systems of organization?

Temperament, then, properly signifies mixture of the elements of organization, fully to consider and partially elucidate which is incompatible with the length prescribed to papers to be read before this body. Therefore, an epigrammatic glance at the basis of the subject of temperaments is all that can be attempted at this time.

Blastema, or plasma, may be said to hold in solution the material primates of all bodies in a chaotic, homogeneous, or unpronounced state of unseen blending of heterogeneous possibilities, out of which each tissue springs directly through the polarization of the primary sleeping, living atoms by the admission of the proper attenuation of the great planetary organizer, (oxygen.)

Passing, for the present, all the truly elementary bodies thus produced, we come to proximately elementary human primates, as found in fish, reptile, bird, beast, and man, the complete development and co-ordination of which properly constitute the human kingdom, whose temperaments we propose to interrogate and pronounce, as far as we may, under the limitations prescribed.

To understand what is meant by human kingdom, a concise statement of the three preceding kingdoms, which are included in and dominated by this, will facilitate apprehension, viz., mineral, vegetable, and animal kingdoms, are but the primates or elemental proximates which, together with a plus (+), constitute the kingdom of man.

The temperament of minerals is the due admixture of zero (0), plus (+), and minus (—), which constitute individual being. Now being is none other than the placing or positing the (+) and (—) in a successive series of placings or movements. Creation, therefore, is but the coming of the (+) and (—) out from the (0), or the spacic or infinite aspect of the whole, the world; while the successive pointings of the (+) and (—) produce the tempic or time aspect of the universe, so that time and space are inseparable from objects of creation. The tension or striving of these three to dominate each other, in the (0) to uncreate or render *in*different and invisible by depolarization, in the (+) and (—) to polarize, point, and differentiate, constitute, individualize, and render apparent, produce the temperament of crystals, which reign supreme in the mineral kingdom. Even at this primary point we have the basic division of temperaments of the human body prophesied in the four (4) classes of earths, viz.: earth earths, water earths, air earths, and fire earths, which correspond to the four orders which each class subdivides into; those of the earth earths corresponding to silicious earths, argillaceous earths, talcose earths, and calcareous earths, (silex clays, talcs, lime,) sufficiently indicate the quaternary character of temperaments.

In the vegetable kingdom we have—1st, parenchyma; 2d, sheath; 3d, axis; 4th, blossom; consisting of—1st, cell, ducts, and tracheæ; 2d, bark, liber, and wood; 3d, root, stalk, and leaves; 4th, seed, ovarium, and corolla. While in the *fruits* of vegetables we have—1st, nut; 2d, plumb; 3d, berry; 4th, apple; with—1st, their shuck, shell, and meat (or kernel); 2d, skin, pulp, shell, and meat; 3d, skin, pulp, pericarp, and seed; 4th, (a repetition of the third, viz.,) skin, pulp, pericarp, and seed. Thus giving us four orders of organs, each of which is composed of three distinct tissues, numbering twelve in all, which trinary division has grown out of the three provinces of the vegetable system, viz.: 1st, the acotyledonous; 2d, monœotyledonous; and 3d, the dicotyledonous modes of germinal force.

But when the vegetable system is completed in fruitage there are four

forms of fruit, each of which (except the first and lowest, which has three) is constituted of four distinct tissues, indicative of the number of organic primates belonging to this kingdom also when complete. So the prophecy of the mineral kingdom is here corroborated as to the number of principal temperaments that are to hold dominion when oxidation shall become completed, and produce the highest type of planetary inhabitant.

The animal kingdom has, like the vegetable, five orders of primary structure, four regular and one which is the flower, or rather fruit of the others, which is prophetic of the recapitulation of all the three kingdoms in one, the crowning excellence or fruitage of all the others in the individually pronounced man, viz.:—

1. Dermatozoa, (skin animals, invertebrates, or mollusks.)
2. Glossozoa, (tongue animals or fishes.)
3. Rhinozoa, (nose animals or reptiles.)
4. Ottozoa, (ear animals or birds.)
5. Ophthalmozoa, (eye animals, mammals, or beasts.)

In reckoning temperaments we begin with the fishes, because here is the first clear manifestation of mind, the highest of which may be taught to respond to acts addressed to their instincts. And then add a temperament at a time, as we see this power of response increase with the elevation of the internal basis from which instincts spring, until we arrive at the perfection of this ground of origin for complete self-consciousness in the head of the mammalia, where alone we find complete and distinct harmonious development of the splanchnic, somatic, and cephalic tissues; visceral or splanchnic, including the intestinal, vascular, and respiratory systems; somatic or bodily, the osseous, muscular, and nervous systems; and the cephalic, the sense or self-conscious seat of intelligence.

Animal Kingdom.

1.	Fishes represent the lymphatic or digestive	T.	
2.	Reptiles represent melancholic or venous	T.	Sanguine.
3.	Birds represent sanguine or arterial	T.	
4.	Beasts represent conceptive, choleric, or judgment	T.	
5.	(Man represents self-conscious or nervous)	T.	

The human kingdom remains to be projected, and we have done with the basic positing of temperaments. This, like the preceding kingdoms, repeats all before it, and adds the distinctive something that differentiates it from all else.

Human Kingdom.

1. Mineral kingdom is said to grow.
2. Vegetable kingdom is said to live and grow.
3. Animal kingdom is said to live, grow, and feel.
4. Man is said to live, grow, feel, and *speak!*

Thus is man not only the head of the mammalian class of animal life, but also the head and crowning excellence of all the planetary existences, whether chaotic, mineral, vegetable, or animal, all of which are but stages of his development; so that we may safely say the whole planet is as human as is its Sovereign and Lord!

From the foregoing it is easy to conceive that the complete development of man must secure the due admixture of all the elements of molecule, tissue, organ, and system, which can produce nothing short of an equal and consequently harmonious conjoint subsistence of all four of the so-called temperaments, or a perfect symphony of temperamental existence.

As growth requires selection and aggregation of the requisite elements to the structure in the little as well as the great sense, we shall have to acknowledge that nutrition presides over all aggregations of congruous substances to crystals, tissues, organs, and systems. By undue or unequal aggregation we have irregular nutrition, which lays at the very bottom of incongruous or unhealthy appropriation of primates.

Simple predominance of well-defined natural tissue cannot be said to be pathological only in the least degree; so that simple predominance of temperament is properly but the inception of disturbance of the harmony of the whole system, and not disease *per se;* only a minus expression of health or a state short of perfect health, a single example of which is not now extant on this planet. Thus the *plan* of temperaments is one, because the plan of evolution is a unit; and nature never works in diverse ways to accomplish identical results.

So when nature shall have found complete interpretation in a systematic correlation of her principles and acts, there will no longer be doubt as to her methods of procedure.

All that is in the way of reducing all varieties of science to the exactitude of numbers is a language that shall be rich as nature, and so definite that no word can be so nearly like any other as to be taken for it by any but the veriest novice. In a word, a language that shall exactly correspond to nature, or the things to be discussed in her domain, which will be so replete and yet so definite that nothing can be left out nor duplicated, thus being unmistakable to the apprehension of all; as is music, arithmetic, geometry, etc. etc.

Feeding is a copulative conjunction of elemental bodies, and produces pleasure, satisfaction to the general system, principally through the gustatory nerve, and incidentally, also, through olfactory, optic, auditory, and general sense; the special senses, other than taste and smell, contribute incidentally by association of ideas, while distention of the receptacles of food, like that of the cells by the nutrient products of food, communicates pleasure and comfort mechanically and dynamically, the joint action of

which polarizes and vivifies the whole system to the point of enjoyment, even to felicity, after long periods of fasting.

I said that circumstances of food, society, and habits, either natural or acquired, had something to do with determining the temperament. I would now say not only the temperament, but the temper for the time, which only needs to be kept up and intensified to dominate the system and become the temperament under whose direction all the life-acts are modified.

Were it not that temperament took hold on molecular, systemic, and conscious life, or on our spirits, souls, and bodies, it would not be a matter of such paramount interest to us to be able to master the subject. But as "evil communications corrupt good manners" among molecules as well as men, we should take earnest heed to the food we eat, the exercise we take, and the company we keep! Does any one say, "I never go into bad company?" Let me say, sometimes bad company comes to us, in food and society, that as effectually corrupt not only our tempers but also our temperaments, as if we had gone to or sought for them!

A form of company which is very invidious, because silent and secret, makes or mars the character of most men. I refer to the trains of thought in which we habitually indulge. Be assured, all you who would enjoy harmonious temperaments, that our company is not all select and divinizing until our very feelings, ideas, thoughts, and meditations have been expurgated from these "little foxes" which so effectually mar the tender vines of temper, character, and temperament!

If you would be harmonious, court harmonious states of the mind. If you would be great, indulge habitually in greatness of thought. And if you would be efficient for good, live regularly and persistently up to your highest conception of that which you would be; and as certain as light brings life, and darkness death, so sure will you be to transcend your highest former ambition and lay a solid foundation from which to project a new and higher status of apprehension and attainment on the one hand, or, neglecting this, dwindle on the other into all the mishaps and ill luck of states of fitful action or inaction to darkness and death, in the exact ratio of the exercise of the *in*different methods of performing the labors of the head, heart, and hand!

New York, Sept. 9, 1863.

"USE OF ARSENIC," ETC.—CORRECTION OF AN ERROR.

BY A. C. HAWES.

I am greatly surprised at some constructions put upon my article on "The Use of Arsenic for Destroying Sensitive Dentine," by the writer of the "editorial" in the June number of the Dental Cosmos. He asserts that my "article has *two* meanings: one of severe rebuke to those who use arsenic

at all for the treatment of the teeth *in any way*, and the other an ironical criticism of the reports which have been made upon its use by those who employ it."

In reference to these statements I desire to say that I had but *one* object in view, and that was to call attention to what I believe to be a very serious and growing evil, the inconsiderate use that is now being made of arsenious acid *simply* for the removal of *sensitive dentine*. This was the caption and the substance of my article. And since its publication new and unmistakable evidence of its injurious effects has almost daily been furnished, both from cases coming under my own observation and those mentioned to me by members of the profession.

As for the assertion that a "severe rebuke was intended to those who use arsenic *at all* for the treatment of the teeth in *any way*," a careful reading of the article itself would seem to be a sufficient refutation. I did not suppose it possible that I could be misapprehended when I said that "for devitalizing dental pulps it is admitted to be preferable to any other agent that has yet been discovered for that purpose," much less that any one should deliberately assert that this language meant exactly the opposite. I have myself used arsenic for *destroying* dental pulps for *many years*, and I believe it to be a perfectly *safe* and *efficacious* remedy for this purpose when *properly applied*.

That any one should imagine the article to be an "*ironical* criticism of the reports which have been made upon its use by those who employ it," is to me quite incomprehensible, as I presented their several statements in the language of the writers, showing merely the positions they took, and the unavoidable conclusions to which they arrived.

New York, 1864.

PROCEEDINGS OF DENTAL SOCIETIES.

THE BROOKLYN DENTAL ASSOCIATION.

A meeting of this Association was held April 13th, 1864. The following subject was discussed:—

"WHAT IS THE BEST TREATMENT OF THE SIX-YEAR OLD MOLARS?"

Dr. Wm. H. Allen thinks them among the most important in the oral cavity. Finds them frequently, in the mouths of children, very soft and chalky; but when they are so soft as to be easily cut away with any instrument, he would try his best to save them by filling, as in a few years the dentinal tubes will become consolidated, when they will be likely to last, with good care, through life.

He mentioned a case of a little boy whose teeth were in this soft state five years ago, but, having been carefully watched and plugged, have been

preserved until the present time, and, although perfectly honeycombed with gold, give good indications that they will last for years.

In reply to a question, he said that if these teeth were in a state of suppuration when quite young, say before ten years, he would not be so confident of saving them; but even in the worst stages would try to keep them, and would not give them up until the last remedy failed. Thinks much can be done to educate parents in regard to these teeth. Finds, in nine cases out of ten, parents do not know that the six-year old molars belong to the permanent set. Dentists should try to remedy this trouble by talking to them, and explaining, at every opportunity, which teeth are deciduous and which permanent; how many there are in each set, and the proper time for and method of their treatment. By doing so they will confer a lasting favor upon both parents and children.

Dr. Fitch said that his motto was—never extract a tooth that can be saved. He advocated the same treatment of these teeth as of any others. If other teeth were ulcerated it would be bad practice to take them out; and so with these. He opposed their extraction principally because of the want of development of the jaw, which follows, and instanced the cases of contraction of the jaws and "baby-faces," so often met with, as a sufficient condemnation of the practice. He most strenuously advocated the salvation of these teeth, even when there was little more left than the roots.

Dr. Abbott then offered the following:—

Whereas, In view of the wholesale extraction of the six-year old molars by many dentists in this country, and in view of highly important results to be attained by their preservation; therefore be it

Resolved, That it is our deliberate conviction that the extraction of these teeth, under any circumstances, is wholly unjustifiable, and should be severely censured.

Dr. Horne said it might appear presumptuous in a young man to offer anything in opposition to those who had preceded him. He would judge that they operated for young persons having remarkably well-developed teeth. Regretted that such was not generally his lot. The resolution might be suited to such practice; it certainly was inapplicable to his own. It had been asserted that lateral pressure was necessary for the support of the teeth and to retain them in their proper positions. This theory is very good when the teeth are in good condition; but in the great majority of cases which come under his observation he considers a reduction of the lateral pressure very desirable. If nature designed close contact and pressure among the teeth, she also intended that they should be perfect in other respects; and one point having failed, a difference of treatment is necessitated. Though objection is made to space between the teeth, yet the same gentlemen will make space with the file in order to fill. Any man who is competent to practice dentistry is able to judge

of the circumstances of the case; and blunderers will blunder with or without rules. We must have freedom of opinion and execution in this matter, and such resolutions are of no avail. There are many cases where the first molars of the permanent set should be extracted. If the teeth were crowded and irregular, he should extract these or other teeth, according to the indications of the case. He read a statistical statement from Tomes, showing the inferiority of the first molars over the other teeth of the second dentition. To save these teeth is often impossible, from the neglect they had suffered in common with the deciduous teeth, among which they were commonly classed by parents.

Dr. Fitch said he was pleased with the candor of the gentleman's remarks, but the conditions which he mentions as requiring their extraction are those which demand the salvation of these teeth. Where teeth are crowded out of the arch, so much more the necessity of saving them and of getting them into their position, that the jaw may receive its proper expansion and the face its natural expression. He denied that the practice of filing for space to fill was chargeable to him. He separates by wedges, and fills out to the natural shape of the teeth. Food collects less readily when so treated than when separated with the file.

Dr. Francis here read a paper upon the subject, which was well received, and of which the following is an abstract:—

"FIRST MOLAR TEETH."

Probably every practicing dentist in the land has at times been much perplexed in attempting to do justice to this class of teeth in their various morbid conditions. Such has been my experience, and I have often felt that these teeth were a curse to humanity, and their presence a punishment inflicted upon the unfortunate children of careless parents for their ignorance and neglect. These teeth always excite unpleasant feelings in my mind whenever a juvenile patient appears before me for the first time. It is not to be presumed that it was intended that this class of teeth should be as short-lived as they usually are; yet they frequently decay very soon after they appear. This, of course, is no fault of the Creator, but of careless, ignorant man. To explain the cause of their premature decay is not my object at this time; but I hope it will be discussed at some future time. To my mind it is one of the most important subjects connected with the science of dentistry. To-night we are to consider these teeth in the condition as usually presented for treatment. It is unfortunate that they are generally considered by the parent as belonging to the deciduous set. For this reason they are neglected until they ache, and the dentist is called upon to extract them. Now what is to be done? In nineteen cases out of twenty the parent will insist upon having the teeth removed. They are tired of hearing the child complain. They believe cold steel to be the most effectual remedy. They fail to see

the utility of dosing and patching such miserable-looking shells. It seems to them a worse than useless expense. Your remonstrances are usually in vain; and, should you refuse to extract, are likely to cause offense, and the patient is perhaps taken to some dentist who *will* remove them. Frequently, too, the family physician has been previously consulted, and advises the removal of such teeth. Of course his opinion is infallible, and to differ from him is presumption. Suppose your arguments in favor of saving such teeth do prevail—you are allowed to medicate and plug them—they are then apt to be objects of constant distrust; they have cost more than their supposed worth; and should they ever after cause trouble, you are put down as an enthusiast or branded as a humbug. But suppose you extract such teeth! That ends the trouble. The toothache is cured; the parent is satisfied; your fee is cheerfully paid; you are complimented for your skill, and thanked for your kindness. Well, what does all this amount to? Every practitioner should do what he conceives to be his honest duty, or he will be true neither to his patient nor himself. And here the question, which has so often occurred to us, arises—What is the best course to pursue in cases of this kind?

Many dentists of sterling worth, who have been careful observers and faithfully study the best means of benefiting their patients, will recommend that whenever the first molars are much decayed and the other teeth comparatively sound, they should be extracted, especially if the jaw is somewhat contracted and the teeth crowded. Frequently these teeth are imperfectly calcified, and, if plugged on one side, are apt to decay elsewhere. In this case, also, their room is deemed of more importance than their presence. It is argued that twenty-eight comparatively perfect teeth are of greater value than thirty-two imperfect ones; and that the removal of the first four molars allows more room for the remaining teeth, thereby lessening their liability to decay. If these teeth are extracted in proper season, their places are soon occupied by their fellows; but if patched up to last but a few years and then removed, the other teeth will not so readily change position nor be so much benefited by the change.

There are other men, equally honest in purpose and of undoubted professional ability, who advise the preservation of these teeth at all hazards, and stoutly protest against their removal, even if nearly crownless. They condemn it as a barbarous practice, unnatural and unnecessary; that it contracts the dental arch and changes the facial expression, etc. Now which course shall we pursue? Shall we, as a general rule, extract those teeth when prematurely decayed; or shall we invariably refuse to extract them? It is unwise to be too ultra in our notions. We should be governed by circumstances as they present themselves. Very honest, well-meaning men may do mischief by advocating too strongly extreme methods of practice. I have seen numerous cases where I firmly believe patients

have been benefited by having their first molars removed, and I have seen contrary results. I am satisfied that frail, low-toned teeth are more apt to decay on their approximal surfaces, when crowded, than when separated. You may reply that this is "unnatural;" that the teeth were intended to approximate each other for mutual support. This may be so; but it is also unnatural that they should decay at all.

I trust that this question will be discussed in a clear, candid manner; and that our friends will not be too dogmatical in their assertions, lest we be led further into the dark.

Dr. Hurd said that he understood little of the *theology* of this matter. One gentleman says that it *was designed* that all of these teeth should be retained. So, by their liability to disease, it would seem that it was designed that their removal should be left to the discrimination of the dentist. If it was designed that these teeth should be retained, then have the accidents of nature proved too powerful for the design. He was pleased with Dr. Horne's remarks. We come in contact with all classes, and must relieve them—the poor as well as the rich. Should he neglect his family to do gratuitous work for the former? If a little sufferer came to him who could not afford an expensive operation to save his tooth, he should take it out. It were inhuman to refuse. But modern reformers would say: "It is *unjustifiable* to remove that tooth." The parent, in astonishment, would reply: "I came to consult you. Are you practicing on other's notions, or have you a mind of your own?" A little common sense is all that is wanted. In the case referred to, it is *demanded* of us, as men and as loving the race, to take out the tooth. It is preposterous to be *laying down rules* for the extraction of teeth. But gentlemen cry out for "full development." Who can say what that is? How few there are with full sets of teeth! It is a mere matter of the imagination, a chimera, a fancied perfection that cannot be attained. The trouble is that there is generally an over-development of the teeth, calling for the extraction of some of them. It is a grand idea—"Be sure you are right, and then go ahead"—but it's a difficult thing to know you are right. Is a tooth with its nerve dead in a normal condition? No. Are you sure, then, that in leaving it in the mouth you do not leave a seed which may produce constitutional difficulty?

Dr. Horne wished to explain in regard to his statement about the filing of teeth. He intended no personal reference to Dr. Fitch. He had seen the operation from the hands of others who advocate the retention of these teeth.

Dr. Fitch said, in reply to the supposed case mentioned by Dr. Hurd, suppose the little sufferer should go to a surgeon with a sore finger, and he should extract it, would that be good practice? It is on the principle that dead men tell no tales that these teeth are extracted; and when gentlemen raise these questions they must expect plain talk. Never extend

a lesion to effect a cure. There is harmony between life and death. We die to live! Life is the result of the ceaseless flow from life to death. If we would have perfect development, we must have harmony between these two forces. In proportion as we remove the nerve from a tooth we succeed in saving it; and the six-year old molars are as salvable as any others.

Dr. Atkinson said that all present were honest men; but we look at things from different stand-points,—hence our difference of opinion and practice. Were our intelligence all equally developed, our practice would be, like well-constructed dentures, equal and regular, producing the highest examples of usefulness.

Let us reason for a moment. We have come up to our present power of apprehension and ability through diverse channels of preparation and experience, and to establish a code of principles it becomes necessary for each to contribute that which he has attained by original discovery, or adoption from others, to the general fund, to render it all complete and useful.

When the teeth get the advantage, in development, of the processes which constitute their sockets, we get into this trouble of inequality, which produces irregularity, rendering the denture unsightly and inefficient for its destined uses. In such cases we should not interfere, unless we understand the normal passage of these bodies from the fluid to the solid state. And then we should have all our knowledge and watchfulness about us, lest in our attempt to assist we interrupt nature in her beneficent efforts to bring about the best development.

It has been advised "*never* to extract a tooth" for the purpose of making room for others to come into the normal line. Let me say there can be no "*rule*" that will suit all cases. All we can do is to let each case be decided by all the attending circumstances of its own relations and the intelligence of him who has charge of it. If a tooth be so far gone as to be beyond restoration to usefulness itself, if it be a support to others, retain it; but if it be not only useless itself, but implicates others, endangering them also, *then remove it!* But never fractionalize short of the best of reasons. It is not pleasant in any sense to extract teeth for children, and hence should never be done short of absolute necessity.

It is said that many patients cannot afford to pay for saving teeth that might be made permanently useful, and, therefore, we are forced to extract them. Never mind the money—save them gratuitously, and trust God for remuneration. An aged physician said: "The poor are the best patients, because God is their paymaster." That is the best money ever earned, as I can truly bear testimony, in comfort of complacency and advance of reputation on a clean basis.

If we do not understand all the intricacies of theology, yet we should

a little of that humanity which connects us all in a common bond, by which we reciprocally exert each one his modicum of influence upon each other and upon the world, under the guidance of the great centrality of government in the "upper congress." He who thinks he can ignore the minutest record of the so-called "little things" of life and practice, so that they will not be patent to "open vision," only proves his ignorance of the first principles of individualized being, and stands in the way of his own advancement, and, instead of helping, hinders the dissemination of light and intelligence, without which we can never see eye to eye, and become the embodiment of knowledge and skill, it is so desirable the dental profession should be.

Dr. Abbott's resolution was laid upon the table.

Society adjourned.

PENNSYLVANIA ASSOCIATION OF DENTAL SURGEONS.

The regular monthly meeting of the Association was held June 14, 1864.

The President, Dr. Fouché, in the Chair.

Dr. Buckingham announced the sudden death of Dr. E. N. Bailey, an active member of the Association, and moved the appointment of Drs. Barker and Peirce, as a committee to draft resolutions expressive of the sentiments of the meeting in relation thereto.

The committee reported the following, which were unanimously adopted; after which appropriate and feeling remarks were made by Drs. Barker and Buckingham upon the character of the deceased, as a man and associate, and of the energy with which he had sought to advance the reputation of the profession, in the few years allotted him of active life.

Whereas, In the death of our esteemed associate and active colaborer, Dr. E. N. Bailey, this Association feel that they are called upon to lament the loss of one of their most active members, and one who, by his past energetic and earnest co-operation in all efforts put forth to advance the standard of professional excellence, deserves more than a passing tribute;

Resolved, That the departure of Dr. Bailey from this field of activity inculcates the serious lesson to each one of us, his friends and associates, to reverence his memory by increased efforts to enlarge the usefulness and cherish the character of the profession to which his short career was so untiringly devoted.

Resolved, That while fully aware of the inadequacy of words upon the occasion of such bereavements, yet we tender to the family our earnest sympathy in this their hour of affliction, and sincerely trust that the benevolent hand of time may yet prove to them that these

"Severe afflictions
Not from the ground arise,
But oftentimes celestial benedictions
Assume this dark disguise."

Resolved, That a copy of these resolutions be forwarded to his family, and also to the dental journals for publication.

James Truman, *Secretary.*

Adjourned.

AMERICAN DENTAL ASSOCIATION.

The American Dental Association will hold its Fourth Annual Meeting at Niagara Falls, on Tuesday, July 26, 1864, at 10 o'clock A.M.

It is hoped that every member and delegate will manifest an active interest by being present at this meeting.

C. R. BUTLER, Cleveland, Ohio, *Corresponding Secretary.*

AMERICAN DENTAL CONVENTION.

The Tenth Annual Session will be held at Detroit, Michigan, commencing Tuesday, August 2d, 1864.

All Dentists in regular practice may become members of the Convention, and all such are hereby invited to attend.

L. W. Rogers, Utica, N. Y.,
A. W. Kingsley, Elizabeth, N. J.,
J. A. Watling, Ypsilanti, Mich.,
A. Hill, Norwalk, Conn.,
H. A. Smith, Cincinnati, Ohio,
Executive Committee.

SUSQUEHANNA DENTAL ASSOCIATION.

In pursuance of a call by a number of dentists, a convention of the profession met at the Montour House, in Danville, Pa., and formed themselves into a permanent organization, adopting the name of The Susquehanna Dental Association.

List of members present: Drs. G. B. Brown and E. C. Kester, Danville; W. A. Chittenden, Scranton; C. S. Beck and J. M. Barrett, Wilkesbarre; C. W. Sanders and John Vallerchamp, Selinsgrove; John Locke, R. E. Burlan, and H. Gerhart, Lewisburg; E. G. Horne, Berwick; George Rishel, Wm. N. Rishel, and H. C. Hower, Bloomsburg; H. H. Martin, Jersey Shore; J. L. Andrews, Milton; G. W. Renn, Sunbury; B. L. Rich, Millville; M. D. L. Dodson, Williamsport; Jno. D.

Wingate, Bellefonte; C. M. Williams, Pittston; B. F. Kinney, Light Street; and W. F. Vallerschamp, New Berlin.

After the adoption of a Constitution and By-Laws, the following officers were elected, viz.:—

President.—Dr. J. M. Barrett.

Vice-President.—Dr. G. B. Brown.

Recording Secretary.—Dr. Jno. D. Wingate.

Corresponding Secretary.—Dr. M. D. L. Dodson.

Treasurer.—Dr. H. H. Martin.

Librarian.—Dr. John Locke.

Executive Committee.—Drs. H. Gerhart, W. A. Chittenden, and G. W. Renn.

Drs. H. Gerhart, C. S. Beck, M. D. L. Dodson, G. W. Renn, R. E. Burlan, and John Locke were appointed essayists for the year.

After a full, free, and amicable discussion, the following, offered by Dr. H. H. Martin, was agreed upon:—

Resolved, That it is the duty of the members of this Convention cordially to unite in raising the prices of their dental services to a fair remunerative standard, in view of the great advance of all things surrounding them; and that we each pledge to the other our honors to labor for the accomplishment of this end, to which we are most justly entitled.

Drs. John Vallerchamp, J. L. Andrews, J. M. Barrett, R. E. Burlan, and E. C. Kester were appointed delegates to the American Dental Association.

Communications were read from distinguished members of the profession containing advice and encouragement, which were placed on file.

The evening session was devoted to a discussion of theories and facts relating to dental science.

Adjourned to meet in Lewisburg, January 11th, 1865.

J. M. BARRETT, *President.*

JOHN D. WINGATE, *Secretary.*

WESTERN NEW YORK DENTAL ASSOCIATION.

THE Second Semi-Annual Meeting of the Dental Association of Western New York was held at Canandaigua, May 3, 1864.

Dr. B. T. Whitney, President, in the Chair.

Dr. R. G. Snow, of Buffalo, Chairman of a committee to compile a history of the progress of dentistry in Western New York, read an interesting and instructive report.

Dr. E. G. Darbey, of Marion, read an essay on "Filling Teeth."

In the discussions during the session, Dr. Daball, of Dansville, said

after he has extracted the teeth, he trims off enough of the alveolus to enable him to use gum teeth for the temporary set.

Dr. Walter, of Rochester, in extreme cases, in order to remove an instrument which has been broken off in a tooth, has used diluted nitric acid to eat it out, and with good success; but advises the practice *only* in extreme cases.

In treatment of alveolar abscess, Dr. Snow, of Buffalo, affords great relief in some cases, by the application of a current of electricity to the gums.

Dr. Whitney, of Buffalo, in similar cases instructed the patient to apply a pledget of cotton, saturated with sulphuric ether, to the gums; believes it to be one of the best remedies used.

Dr. Walter, after cleaning out the nerve cavity, plugs it full of cotton, saturated with the extract of ginger, to heal up an abscess; often lacerates the gum and applies the same to it.

Dr. Bristol, of Lockport, is often surprised at seeing plugs in teeth, that were inserted twenty-five years ago, when the facilities for filling were so imperfect; is very careful to have the points of his pluggers perfect; thinks one never gains anything by speaking to a patient about holding the tongue in a certain position, or how to breathe; hopes the time will come when the different branches of dentistry will be practiced harmoniously by separate operators.

The session of the Association lasted two days, and altogether was an agreeable and profitable meeting.

Lockport was appointed as the place for the annual meeting on the first Tuesday in October next.

The present officers of the Association are:—

President.—Dr. B. S. Whitney, of Buffalo.

Vice-President.—Dr. S. W. Bristol, of Lockport.

Secretary.—A. G. Coleman, of Canandaigua.

Treasurer.—E. L. Wood, of Brockport. A. G. C.

HUDSON VALLEY DENTAL ASSOCIATION.

At a meeting of the dentists of Troy, Lansingburg, Waterford, and vicinity, held at the office of Dr. O. R. Young, December 8th, 1863, Dr. H. H. Young was called to the Chair and Dr. S. J. Andres was appointed Secretary. The object for which the meeting was called was stated by Dr. N. D. Ross, and several of the gentlemen present expressed themselves strongly in favor of forming a Dental Association, and all present were unanimous in their expressions that it would be for the general interest of the profession to form such an association. Whereupon a motion

was made by Dr. French that a committee of three be appointed by the Chair to draft a Constitution and By-Laws. The Chair appointed Drs. S. D. French, L. C. Wheeler, and O. R. Young; and, on motion, the Chairman was added to this committee.

A second meeting was held at the office of Dr. S. D. French, December 29th, when the committee made their report; and, on motion, the Constitution and By-Laws were unanimously adopted.

An adjourned meeting was held at the office of Dr. C. H. Jenkins, January 5, 1864.

The following gentlemen were elected officers for the ensuing year:—

President.—Dr. H. H. Young, Troy.

Vice-President.—Dr. S. D. French, Troy.

Recording Secretary.—Dr. S. J. Andres, Troy.

Corresponding Secretary.—Dr. S. P. Welch, Lansingburg.

Treasurer.—Dr. O. R. Young, Troy.

Executive Committee.—Drs. L. C. Wheeler, S. P. Welch, and C. H. Jenkins.

On taking the chair, the President made some pertinent remarks, glancing at the history of the profession and congratulating the Society on its organization and prospects.

BUFFALO DENTAL ASSOCIATION.

At a meeting of the dental profession of the City of Buffalo, N. Y., held on the evening of May 27th, 1864, at Medical Hall, for the purpose of organizing a City Dental Society, the following named gentlemen were present:—

Drs. Geo. E. Hayes, C. W. Harvey, R. G. Snow, B. S. Brown, B. T. Whitney, N. Whitcomb, Leon T. Harvey, Theo. G. Lewis, J. R. Wetherill, Geo. B. Snow, A. P. Southwick, Fred. Oliver, J. H. Giffing, M. B. Straight, M. F. Cook, S. A. Freeman.

On motion, Dr. Geo. E. Hayes was appointed Chairman, and Dr. Geo. B. Snow, Secretary *pro tem.*

The Chair appointed Drs. B. T. Whitney, R. G. Snow, B. S. Brown, C. W. Harvey, and J. R. Wetherill, a committee to draft Constitution and By-Laws.

The committee subsequently reported a Constitution and By-Laws, which were amended and adopted.

After all present had signed the Constitution, an election for officers was held, which resulted as follows:—

President.—Dr. Geo. E. Hayes.

Vice-President.—Dr. R. G. Snow.

Secretary.—Dr. Geo. B. Snow.

Treasurer.—Dr. J. R. Wetherill.

Adjourned to June 6th, at the same place of meeting.

Meetings will be held on the first Monday evening of each month. Dentists from abroad are cordially invited to attend.

DR. GEO. B. SNOW, *Secretary.*

WABASH VALLEY DENTAL ASSOCIATION.

PURSUANT to a call of the dentists in good standing in the Wabash Valley, a meeting convened in the City of Lafayette, Indiana, on the 20th day of April, 1864, to associate themselves together to cultivate the science and art of dentistry and all its collateral branches; to elevate and sustain the professional character of dentists; to promote among them mental improvement, social intercourse, and good feeling; and to collectively represent and have cognizance of the common interests of the dental profession in the said Wabash Valley.

On motion, H. R. Hurd, of Attica, Ind., was appointed Chairman, W. H. Pifer, of Lafayette, Ind., Secretary *pro tem.*

On motion, a committee of three, consisting of Cunningham, Canine, and Moore, were appointed to report Constitution and By-Laws. The committee submitted a form of Constitution and By-Laws, which were adopted, and the Society organized under the name of THE WABASH VALLEY DENTAL ASSOCIATION.

The following practicing dentists paid their initiation fee and signed the Constitution: W. H. Pifer, J. S. Snoddy, A. M. Moore, E. V. Burt, H. R. Hurd, W. B. Moffatt, J. C. Winslow, J. W. Fahnestock, A. B. Cunningham, J. W. Budd, J. F. Canine.

After a social and spirited discussion, which all participated in, the meeting adjourned to meet at Crawfordsville, Ind., on the 25th day of October, 1864. A. M. MOORE, *President.*

W. H. PIFER, *Secretary.*

CENTRAL NEW YORK DENTAL ASSOCIATION.

THE Second Annual Session was held at Auburn, May 10th.

Number in attendance unusually large.

Dentists of neighboring cities are invited to meet us at Syracuse, November 15th.

The following officers were elected for the ensuing year:—

President.—Dr. S. B. Palmer.

Vice-President.—Dr. G. W. Tripp.

Recording Secretary.—Dr. S. G. Martin.

Treasurer.—Dr. W. C. Orcutt.

Corresponding Secretary.—Dr. P. Harris.

The retiring President made an appropriate address. Interesting discussions followed, principally upon the preservation of the natural teeth.

S. G. MARTIN, *Recording Secretary.*

A DENTAL SOCIETY IN WESTERN VIRGINIA.

IT will be gratifying to those who are interested in the establishment of dental societies to know that a successful effort has been made to form a dental society in Western Virginia, and that Dr. Abr. Robertson, of Wheeling, has been elected as a delegate to represent this organization in the American Dental Association at the next annual meeting, to be held at Niagara.

EDITORIAL.

SENSITIVE DENTINE—ARSENIC, AND THE TREATMENT OF THE DENTAL PULP.

IT was promised in the last number of the DENTAL COSMOS that I would give my experience in the use of arsenic. Dentistry is perhaps more of a *demonstrative art* than any other branch of the great healing art, and there should not be a very wide difference of opinion among men of proper information and understanding who are engaged in its practice. There is no "twenty" ways, so to speak, of doing things in our profession, and especially in treating tender teeth, when such thing is desirable; and it is desirable, nay, absolutely necessary, in the present age, to destroy the pulp of a tooth when it becomes exposed; and it is also necessary to palliate the sensitiveness of dentine before the pulp is exposed in some patients, in order to successfully plug a tooth. This I comprehended as necessary shortly after I came into the profession, *twenty-seven years ago.* At that time there was no settled method of treating either the pulp or the sensitive dentine. Some of the most eminent in the profession extracted teeth as soon as the pulps became exposed; some cauterized the surface of the pulps and plugged over them; some used astringents, "nut-gall," etc. for an indefinite time, and then plugged over them; some plunged a *hot* instrument into the pulps, and then plugged the teeth; others adopted a more refined method, and used the instrument in its *cold* state; some treated sensitive dentine with the hot instrument. There were other methods of less note, too numerous to mention. Of

course this was all done, it seemed, as if the dental pulp was a sensitive vermicule in a little hole in a bone, and all that was to be done was to *kill* it with a stunning blow, worry it to death, or smother it by prolonged suffering, or *punch* it to death with a steel instrument, without the least idea that it was connected with a *living human brain!* and was, through that means, capable of shocking the entire frame. I found that I could *not* practice dentistry without exciting shrieks and groans; it was true, and is, to a great extent, yet, that it was with fear and trembling that a patient would approach a dentist. I could not practice with satisfactory success by adopting the practices given in the books which were then available or known to me, consequently I set to experimenting, with the advice of the different medical gentlemen with whom I became acquainted. My principal associates were medical men, as I was a student of medicine, and dentists, doubtless, all are aware, were extremely shy of each other. My own preceptor in dentistry, Dr. M. A. Blankman, of Philadelphia, practiced one method after another, without any decided aim. If one failed, another was tried of the different methods of the day. In experimenting with the concentrated acids in use, all that had been recommended were tried in vain.

To save the nerve alive was one of the first things that I regarded as an absurdity. I am not sure now whether it was the late Dr. A. Drake or Dr. M. F. Groves, of our city, who suggested to me the use of arsenic in some form, or whether it was a suggestion of my own; but it was the result of conversation with one of them that it was first proposed and practiced. I cared nothing at that time, nor did either of them, who originated a different treatment than was then generally practiced, as far as the credit of it was concerned. Sufficient for the day was to obtain a substance that would kill a dental pulp or sensitive dentine, as the one was as important as the other.

It will be seen, by referring to a letter in the April number of the DENTAL COSMOS, in speaking of "Wood's" metallic filling, that I operated in Dr. Groves' family in the spring of 1838. It was in March of that spring that I first used arsenic in dentistry. It will also be seen that Dr. S. Spooner's work, (second edition,) "A Guide to Sound Teeth," was published in 1838, giving the history of the use of arsenic by himself and his brother, Dr. J. R. Spooner, of Montreal; but by referring to notes addressed to Dr. Spooner, of New York, by many distinguished medical men, recommending his book, they bear dates as late as the 25th of May, 1838. I merely cite these facts to show that I did not get the suggestion of the use of arsenic from Dr. Spooner's work. I never saw the first edition; nor is it likely that it appeared in it, from the following passage in the second edition: "We claim for our brother, Dr. J. R. Spooner, of Montreal, the credit of this valuable discovery, and for

ourselves no small share of credit for thus frankly laying it before the dental profession and the public." Of course those gentlemen used arsenic before I did, and all I want to say is that I did not get a knowledge of its use from them or any other dentist. It grew out of my association with medical men in my early pupilage. And, furthermore, I do not claim that I first suggested its use in my practice. I am only seeking to establish the fact that I commenced the use of arsenic on the teeth without the aid of other men's experience, and modified its use according to my own judgment and as I became acquainted with its properties, and with the anatomy and physiology of the teeth; but I know full well that it was by *my own suggestion* that I used it for *sensitive dentine;* and after an experience of more than a *quarter of a century*, it is surprising that a writer and dentist of experience should discourage its use, or infer for a moment that those who use it "persist in clinging to what is evidently injurious or of doubtful utility, because it is a *convenient* remedy, or answers perhaps a temporary purpose."

I never used it for convenience, (although convenience did follow its use,) but for a *permanent* purpose. I used it as a matter of *humanity*, and to succeed in successfully plugging teeth which could not be plugged without it, as I have a vast number of facts to prove. Its use requires a complete knowledge of the properties of the substance itself and the parts to which it is applied, and I do not consider that I cling to it, or that any other well-informed operator does, on account of its convenience, and am not responsible for the mischief it is capable of doing in the hands of persons who know nothing about it or the proper time for its employment. I do not use it in all cases where pain is experienced in excavating decay, but I always use it for destroying the dental pulp.

J. D. W.

(To be continued.)

PUBLISHER'S NOTICE.

THE present number closes the Fifth Volume of the DENTAL COSMOS. Its publication will be continued as heretofore. The first number of the Sixth Volume will appear in the early part of August.

Notwithstanding the greatly increased price of its publication, we have concluded to continue it at the same price as heretofore, viz., $2.50 per annum *in advance*, trusting that the friends of dental science will manifest their appreciation of our efforts not only by maintaining its present circulation, but by using their influence to extend its usefulness in adding to the number of its supporters, readers, and contributors.

REVIEW OF DENTAL LITERATURE AND ART.

BY J. H. M'QUILLEN, D.D.S.,

PROFESSOR OF ANATOMY, PHYSIOLOGY, AND HYGIENE IN THE PHILADELPHIA DENTAL COLLEGE.

DEATH OF DR. EDW. N. BAILEY.—Those members of the profession who have had any acquaintance with Dr. Edw. N. Bailey, will regret to hear of his death, which occurred after a very short illness on June 11th, 1864.

A young man in years, (æt. 30 at the time of death,) and apparently in the possession of an excellent constitution, he gave every promise of a long life and an eminently useful professional career, which was brought to a sudden close in the most unexpected manner to him and his friends.

In his specialty, mechanical dentistry, he was *pre-eminently a skillful workman*, and in addition to this, possessing a high ideal of his art, he always aimed in a conscientious manner to secure the most perfect realization of his elevated standard. I have no desire that these words shall be regarded an idle compliment to the dead, but as a just tribute of respect to the memory of one whom, during a professional acquaintance of several years, I had every reason to regard as a man who was earnestly striving to improve, to the best of his abilities, the talents which an all-wise Providence had vouchsafed to him.

As a workman, he was not a mere dull routinist and copyist, but possessing considerable originality, was constantly endeavoring to add to the improvements in dentistry: in illustration of this, his moulding flask is the most simple and efficient apparatus of the kind in use. There were other directions in which he had improved and was seeking to improve, but this will suffice as evidence of his abilities and inclination in that direction.

His contributions to the literature of the profession, although creditable to him, were somewhat limited, owing, no doubt, to his devotion to his specialty, and the necessity of working night and day to meet the demands upon him by his patients and fellow-practitioners—for the latter of whom he did a large amount of work.

The official position which he held as Demonstrator of Mechanical Dentistry, was filled in a manner highly creditable to him, and decidedly to the advantage of those whom it was his duty to instruct.

In his professional relations, and in his intercourse with society, he bore a fair and honorable reputation, and in leaving this life, said, in his dying moments, that having endeavored to do his duty to others and to wrong no one, with a firm faith in a Divine Providence, he hoped to enjoy rest and happiness in the next world.

Cut off in the flower of manhood, just at a time when apparently about

to reap the rich and just fruition of industrious and honorable exertions, his sudden and unexpected death may appear like a hard and untimely end; but it must be borne in remembrance that an all-wise Ruler orders all things aright. Had he been permitted to live a few years longer, there can be no question of doubt that his sphere of usefulness to the community and the profession would have been largely increased, and that he would have left a wider though not a more honorable reputation behind him. Dying as he did, young, it may be said of him—

> "Happy he
> Who to his rest is borne,
> In sure and certain hope,
> Before the hand of age
> Hath chilled his faculties,
> Or sorrow reached him in his heart of hearts;
> Most happy if he leaves in his good name
> A light for those who follow him,
> And in his works a living seed
> Of good prolific still."

Suggestions in Practice.—There are some things in practice on which the comfort of patients greatly depend, and in the observance of which much unnecessary suffering, sometimes inflicted by thoughtless operators, could be avoided, that appear so plain and self-evident, that one naturally feels some hesitation in directing attention to them, and but for the queries and complaints of patients who have suffered from the non-observance of such matters, they would be passed over without comment.

In illustration of this it is not an unusual thing to have strange patients ask, "Is not the syringe a new instrument in the practice of dentistry? I have been in the habit of going to such a practitioner for years, and I never knew him to use it in operations on my teeth." Judging from the frequency with which the query is put, it is reasonable to infer that this instrument is not as generally used by the profession as one might suppose it would be; and yet it is so indispensably necessary in the performance of operations, that it is difficult to conceive how any practitioner can manage without one. It is not enough, however, to have and use one, but it is also important that the instrument should be a *good* one, and capable of throwing a steady current of water with sufficient force into the cavity of a tooth to effectually dislodge every portion of loose decay or foreign substances.

To have in place of this, one so poorly constructed that it spurts and fizzles, or, at the best, throws a weak and unsteady stream, rendering it practically useless, and then make no effort to improve it or to procure a better one, as is not unfrequently done, is on a par with the persistent

and determined efforts, worthy of a better cause, which are sometimes made to excavate a cavity with dull instruments. When the syringe is a good one, care should be exercised to throw the stream in such a direction as to have it caught in the mouth of the patient, in place of using it in such a bungling manner as to cause the water to fly all over the patient and operator. A far more important consideration than this even, is the employment of tepid instead of cold water; while the employment of the latter is sometimes justifiable as a valuable means of diagnosis, to throw it thoughtlessly or carelessly on a tooth in which the dental pulp is exposed, or nearly so, is the height of cruelty; for as a general thing it is followed by the most intense and aggravating pain. Whereas if tepid water had been used, not only would no discomfort have been experienced, but, on the contrary, in many cases the temperature of the water, acting as a palliative, removes the pain which the patients have been suffering from for hours.

In connection with this, it may not be amiss to direct attention to the propriety of dipping the forceps into tepid water prior to bringing them in contact with a tooth which has to be extracted. Even in summer time, the disagreeable sensations arising from the "cold steel" alone are so intensely unpleasant, that the pain of extraction is greatly increased, and the apprehensions of the patient proportionally enhanced. In the winter time, the depressed state of the temperature of course makes the instrument still more objectionable.

In conclusion, those who are in the habit of paying strict attention to the points referred to above, and suppose that every one is familiar with them, at least may think that reference to such matters is hardly demanded on the part of a journalist; but when it is remembered how much the comfort of patients and the success of operators depend upon attention to small matters, one would be justified in dwelling upon rather than merely referring to far less important subjects than the use of the syringe. If only a few practitioners, or even one, by reading such suggestions, should be led to adopt a course of practice which shall render the professional services more efficient and deprive them of some of their unpleasant features, such articles will not have been written in vain.

COMPARATIVE ANATOMY OF THE TEETH OF MAN AND APES.—The following extract is taken from PROF. HUXLEY'S work on "MAN'S PLACE IN NATURE:"—

"In connection with the skull, I may speak of the teeth—organs which have a peculiar classificatory value, and whose resemblances and differences of number, form, and succession, taken as a whole, are usually regarded as more trustworthy indicators of affinity than any others.

"Man is provided with two sets of teeth—milk teeth and permanent

teeth. The former consist of four incisors, or cutting-teeth; two canines, or eye-teeth; and four molars, or grinders, in each jaw, making twenty in all. The latter comprise four incisors, two canines, four small grinders, called premolars or false molars, and six large grinders, or true molars in each jaw—making thirty-two in all. The internal incisors are larger than the external pair in the upper jaw, smaller than the external pair in the lower jaw. The crowns of the upper molars exhibit four cusps, or blunt-pointed elevations, and a ridge crosses the crown obliquely, from the inner, anterior, cusp to the outer, posterior cusp. The anterior lower molars have five cusps, three external and two internal. The premolars have two cusps, one internal and one external, of which the outer is the higher.

"In all these respects the dentition of the Gorilla may be described in the same terms as that of Man; but in other matters it exhibits many and important differences.

"Thus the teeth of Man constitute a regular and even series—without any break and without any marked projection of one tooth above the level of the rest; a peculiarity which, as Cuvier long ago showed, is shared by no other mammal save one—as different a creature from Man as can well be imagined—namely, the long extinct *Anoplotherium.* The teeth of the Gorilla, on the contrary, exhibit a break, or interval, termed the *diastema,* in both jaws: in front of the eye-tooth, or between it and the outer incisor, in the upper jaw; behind the eye-tooth, or between it and the front false molar, in the lower jaw. Into this break in the series, in each jaw, fits the canine of the opposite jaw; the size of the eye-tooth in the Gorilla being so great that it projects, like a tusk, far beyond the general level of the other teeth. The roots of the false molar teeth of the Gorilla, again, are more complex than in Man, and the proportional size of the molars is different. The Gorilla has the crown of the hindmost grinder of the lower jaw more complex, and the order of eruption of the permanent teeth is different; the permanent canines making their appearance before the second and third molars in Man, and after them in the Gorilla.

"Thus, while the teeth of the Gorilla closely resemble those of Man in number, kind, and in the general pattern of their crowns, they exhibit marked differences from those of Man in secondary respects, such as relative size, number of fangs, and order of appearance.

"But if the teeth of the Gorilla be compared with those of an Ape, no further removed from it than a *Cynocephalus* or Baboon, it will be found that differences and resemblances of the same order are easily observable; but that many of the points in which the Gorilla resembles Man are those in which it differs from the Baboon; while various respects in which it differs from Man are exaggerated in the *Cynocephalus.* The number and the nature of the teeth remain the same in the Baboon as in the Gorilla and in Man. But the pattern of the Baboon's upper molars is quite different from that described above: the canines are proportionally longer and more knife-like; the anterior premolar in the lower jaw is specially modified; the posterior molar of the lower jaw is still larger and more complex than in the Gorilla.

"Passing from the old world Apes to those of the new world, we meet with a change of much greater importance than any of these. In such a genus as *Cebus,* for example, it will be found that while in some second-

ary points, such as the projection of the canines and the diastema, the resemblance to the great ape is preserved; in other and most important respects, the dentition is extremely different. Instead of 20 teeth in the milk set, there are 24: instead of 32 teeth in the permanent set, there are 36, the false molars being increased from eight to twelve. And in form the crowns of the molars are very unlike those of the Gorilla, and differ far more widely from the human pattern.

"The Marmosets, on the other hand, exhibit the same number of teeth as Man and the Gorilla; but, notwithstanding this, their dentition is very different, for they have four more false molars, like the other American monkeys—but as they have four fewer true molars, the total remains the same. And passing from the American apes to the Lemurs, the dentition becomes still more completely and essentially different from that of the Gorilla. The incisors begin to vary both in number and in form. The molars acquire, more and more, a many-pointed, insectivorous character, and in one genus, the Aye-Aye, (*Cheiromys*,) the canines disappear, and the teeth completely simulate those of a Rodent.

"Hence it is obvious that, greatly as the dentition of the highest Ape differs from that of Man, it differs far more widely from that of the lower and lowest Apes."

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DENTAL REGISTER OF THE WEST—APRIL.

"A PRIZE ESSAY ON ANÆSTHETICS.—The following resolution was offered and passed by the Mississippi Valley Dental Association. We direct the attention of our readers to it:—

"1. *Resolved*, That a gold medal, not exceeding $100 in value, be awarded by the Association for the best Essay on Anæsthetics, to be approved by a committee of the Association.

"2. That essays competing for prize must be placed in the hands of the committee as early as January 1st, 1865.

"3. That the committee have power to reject all essays presented, if regarded as unworthy of the award.

"4. That rejected essays be promptly disposed of by the committee as directed by the authors.

"5. That when the committee has made the award, the approved essay be sealed up, and thus preserved till the committee report to the Association, when it and the envelope containing the author's name are to be opened.

"6. That the copyright shall belong to the Association.

"7. That the committee shall not permit any one to inspect or see the copy of any essay till after making a report to the Association.

"8. That the committee report at the next annual meeting.

"The following persons compose the committee to report upon the Essays presented:—

"J. Taft, Geo. Watt, Jas. Taylor, A. Berry, Geo. F. Foote, *Cincinnati.*"

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"ANOTHER MEDAL.—The Miss. Valley Association proposes to give a silver medal to the value of twenty dollars ($20) to that person who, prior to Feb. 1st, 1865, makes the most valuable invention, improvement,

or discovery in anything or matter pertaining to dental practice or science, the award to be made by the following committee, appointed for that purpose, viz., Drs. A. S. Talbert, S. Driggs, Lexington, Ky.; W. H. Shadoan, Cincinnati.

"We hope that all persons interested will make an effort to bring to the notice of this committee everything that would deserve their consideration. T."

"DEATH OF DR. SAMUEL ABBOTT.—We have to record the departure of another highly esteemed and estimable citizen—Dr. Samuel Abbott. A native of Westford, he came to Lowell and established himself in business as a dentist twenty-six years ago. He died after a lingering illness, on Tuesday afternoon, May 17th, aged 51 years. Doctor Abbott was a quiet, unassuming man, always faithful to his convictions of duty, exemplifying in his life that love of God which is shown by regard for the rights of man. He was a true friend, a kind husband and father, and eminently exemplary in every relation. His death is the first among his profession in this city. The following tribute to his memory has been furnished for publication:—

"At a meeting of the dentists of Lowell, Wednesday evening, May 18th, the following preamble and resolutions were adopted.

"Whereas, it has pleased the Great Disposer of events to call from earth our esteemed professional brother and fellow-citizen, Dr. Samuel Abbott; therefore

"*Resolved*, by the dental profession of Lowell, that by his death we have lost an honorable member of our fraternity, and the public a useful and worthy citizen.

"*Resolved*, That we deeply sympathize with his afflicted family and friends in this their sad bereavement, and invoke, in their behalf, the comforting spirit of Him who doeth all things well.

"*Resolved*, That a copy of these resolutions be respectfully tendered to the family of the deceased, also published in the papers of the city, and in the DENTAL COSMOS, *Dental Times*, and *Dental Register of the West*.

"A. LAWRENCE, *Chairman*.

"G. A. GERRY, *Secretary*."

THE DENTAL REGISTER OF THE WEST—MAY.

"NECROSIS OF THE INFERIOR MAXILLA. By J. RICHARDSON, D.D.S.—*Case.* Active, intelligent, German boy, æt. nine years; nervo-lymphatic temperament; strumous habit. During the month of August, 1862, was attacked with herpes circinatus, or ring-worm, affecting the right cheek. After the lapse of two or three months, during which time he had been subjected to medical treatment, the eruption suddenly disappeared on the use of some local application to the diseased surface, and simultaneously with its recession, the patient was seized with severe pain in the teeth of that side, while the gums and cheek became much swollen, the pain in the teeth continuing for some two weeks. At the end of this time, the temporary and first permanent molars became very loose from the disease which had so far invaded the maxillary bone as to indicate their removal, which was accordingly done.

"The case came under my charge in November following. The portion of the jaw from which the teeth were taken was denuded and necrosed to something more than the depth of the sockets, but remained firmly adherent. Great tumefaction of the cheek, internally and externally, existed, with induration of the parts at the base and angle of the jaw, and limited capacity to open the mouth. The disease at this time was unaccompanied with pain; patient somewhat anæmic, but general health fair and appetite good.

"The physician in charge of the case had prescribed constitutional remedies comprising alteratives and tonics, and had used, in conjunction with these, some acid mixture as a solvent to the necrosed portion of bone. The latter treatment, as being not only useless but pernicious, was abandoned; the former, with some modifications, continued. The parts affected were kept well cleansed with detergent washes, and occasional poultices and fomentations applied externally to the cheek. For the two or three succeeding months no material change occurred except a gradual extension of the disease toward the base of the jaw, and posteriorly into the angle of the same. Believing that a successful issue could only be hoped for by establishing a line of demarkation between the living and dead portions of bone, and exfoliation of the latter, and that this could be best effected by constitutional remedies and time, I had given no encouragement to the frequently expressed desires of the physician and parents to remove the dead portions by operation with instruments, believing that such a procedure could have no influence in either promoting or establishing a cure. The anxiety of the father of the boy, however, to have *something* done toward getting rid of the necrosed portion exposed to view, induced me finally to accede to his wishes, and neither his physician nor myself having bone forceps of suitable pattern for the operation, I gave him a letter to a distinguished surgeon of Cincinnati, who operated for its removal before the medical class at St. John's Hospital, in the fore part of March, 1863. The father returned with the boy in a few days, elated and hopeful of results. All accessible portions of dead bone had been thoroughly removed, but it required no great amount of surgical acumen to divine that it yet remained for the efforts of the system, aided by judicious treatment, to accomplish what surgical skill was impotent to effect without absolute exsection of the jaw. The removal at this time of the family physician to a distant place, brought the patient exclusively under my control. As constitutional remedies, I prescribed, for the most part, syrup of iodide of iron in combination with the compound syrup of sarsaparilla; moderate exercise in the open air, and a generous diet. Topically, careful cleansing of the parts by injections of simple tepid water, dilute tinct. myrrh, and occasionally a solution of chlorinated soda. Careful examinations of the case were made from time to time, and it was soon evident that necrosed portions remained after the operation. In a month or six weeks thereafter, decided mobility of the remainder of the bone not operated upon was discovered, and seizing it with a pair of root forceps, I removed, by careful traction, a thin layer of bone an inch or more in length, forming the base, and which comprised all that remained of the body of the jaw originally affected and subsequently operated upon. There was now no necrosed portion visible except a small piece fronting the angle of the jaw, but on lifting loose flaps of tumefied gum overhanging it, dead portions were discoverable extending some

distance into the ramus, but firmly adherent to the living portions beyond. The constitutional treatment was continued and exfoliation waited for, examinations of its condition being frequently made.

"About the middle of October last, I found evidence of complete detachment existing, and having made what dissections I could with the lancet from around the base of the dead bone, and having enlarged the opening in front somewhat, I seized the anterior exposed portion of the mass with root forceps, and by gentle but persistent manipulation succeeded in bringing it away entire. The portion removed embraced the entire angle of the jaw; this, with the former portion removed, involved the complete loss of the maxillary bone from a point corresponding with the anterior bicuspid tooth to a point near the bifurcation formed by the coronoid and condyloid processes, or more than two-thirds of the right half of the jaw. In neither case was the removal of the fragments accompanied with severe pain or any considerable hæmorrhage.

"It is now some six months since the last portion was taken away. The tumefaction of the cheek has almost entirely disappeared; the parts within have closed up and present a perfectly healthy appearance; free action of the jaw; general health and appetite good. The external contour of the jaw is a little fuller and more rotund from the deposit of new osseous material at the base. The anterior bicuspid was erupted during the course of the disease, and now occupies its place in the arch, firm and apparently uninjured. The teeth posterior to the bicuspid are of course lost.

"In connection with this case, an inquiry of considerable practical interest naturally suggests itself. What influence did the sudden suppression of the surface eruptions have in the development of necrosis of the jaw? If they bore the relation of cause and effect, as they manifestly seem to have done, the case affords another illustration of the danger of working injury to other and more vital organs by a too active topical treatment of eruptions and other forms of surface disease."

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THE DENTAL REGISTER OF THE WEST—JUNE.

"TEMPERING INSTRUMENTS FOR CUTTING. By CHARLES BUTLER, D.D.S.*—In order to be able to make first-class operations, it is of the highest importance that we should have instruments that are adapted to the work we have daily coming before us as dental surgeons. We are often called upon to bring into requisition the skill of the artisan as well as the artist; *both* being indispensable, in order to render the highest expression of our science.

"It is not possible for a man that *simply* manufactures instruments for the market to know their adaptability, as one that is constantly operating, and often finds it a hard matter to make the case fit the instruments, instead of having the instruments well adapted to the case in hand.

"Now, in order to obviate this difficulty, that so often arises, especially to those that have more recently entered the field of operative dentistry, and are somewhat removed from the large cities, where instruments can be more readily pointed by a manufacturer, under the direction of the

* The author of this article, as a member of the O. N. G., has entered the U. S. service for a hundred days.

operator, as circumstances may require, I would suggest a simple remedy for such inconveniences.

"First procure some *square* steel of the best quality, of such sizes as you need for the various cutting instruments required. The best English steel can be procured of Jessop & Sons, 91 John Street, N. Y. Three sizes are sufficient for all cutting instruments: one, one-fourth inch, and the next two sizes smaller. Round steel is unfit for cutting instruments. After the steel has been carefully forged and the points properly formed, taking care not to over-heat the point at *any* part of the process of working it up, I have found the following material a great assistant in producing good cutting points as a recarbonizer: Rosin, 1 ℔.; lamp-black, 2 oz.; pulverized charcoal, $\frac{1}{2}$ oz. Melt them together in a tin can or box, and it is ready for use. Now heat the point up carefully to a dull red; then dip it in the mixture a moment; heat again carefully up to a red, and plunge in soft water, or the following as a tempering water: Sal ammoniac, 4 oz.; nitrate of potash, 4 oz ; indigo, 1 oz.; rock salt, 1 ℔.; soft water, 2 galls. Keep it corked in a stone jug. The point being hard, it should be grasped with pliers, supporting the shaft at the same time; then hold the shank of the instrument over the flame of the lamp, or throw a fine blaze on the shank with the blow-pipe, which perhaps is better, drawing the shank down to a spring temper to the angle, or as far as you wish a cutting blade.

"If you wish to cut enamel, the temper should not be started at all in the blade; leave it hard, and, if it has not been over-heated in working, it will not break readily. Even for cutting dentine the point may be left HARD. All blades should be left thick, and ground into shape or an edge after being tempered. 'By so doing you will not be likely to burn the point while hardening.' (*C. Palmer*, Warren, Ohio.) Plugging instruments can be worked and tempered by the above process by drawing them down to a spring temper.

"Great care must be taken to clean and polish the instrument after using the tempering water, or they will rust badly. This is one great objection, and I only use it for large instruments, water being sufficient for all ordinary purposes; but the carbonizing material I consider of much value in producing good instruments."

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"GONE TO THE WAR.—Our co-editor and friend, DR. G. WATT, has entered the service of our country, in the capacity of surgeon to the 154th O. N. G., to be gone a hundred days. He is now stationed at New Creek, W. Va., said to be a very good place for guerrillas.

"By this arrangement the readers of the *Register* will suffer loss. We all suffer from this war; but we make this timely announcement that our readers may know what's the matter for the next three months.

"We trust he will return at the end of his term safe, much strengthened and invigorated by the change. T."

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EVENING TELEGRAPH.

"THE SELECT FEW.—'He wrote for the select few, not the vulgar mass of mankind.' How often do we meet with this lofty sentence in notices of authors who have failed to acquire a hold upon the popular heart! Who are the members of this limited circle for whom the knight of the

pen taxed his brain and spent his ink? What has set them on a height apart from their fellow-men? And why should an author, who thinks himself possessed of the treasures of genius, pour them forth for the benefit of this precious coterie alone? These questions are perfectly natural, and easy to be put, but rather difficult to answer satisfactorily. To us it seems that this 'select few' is, in general, composed of people filled with an idea that they have a faculty of appreciation denied to a majority of their kind; that their insight is deeper and their intellectual sense more delicately refined; that extensive cultivation has raised them to a position unapproachable by others. They have a proclivity for hunting up poets whose language is so utterly cloudy that it becomes a question whether it is burdened with any meaning at all, and holding them up as great lights and the sublimest bards who ever struck the lyre; novelists so intensely metaphysical that ordinary observers of nature and character conceive their works to have been written in the mood of confirmed hypochondriacs, or in some out-of-the-way place where the sunshine never shot a ray, and every visible form partook of the grotesque; and transcendental philosophers, whose solemn lucubrations appear to us plain people to be a compound of oddity and drawling verbiage. The 'few' then apply themselves to extravagant puffing—complain of the dullness of appreciation in the mass, who permit such 'glorious spirits' to pine in poverty, while their productions become coated with dust in the bookseller's store; take credit to themselves for having read, comprehended, and ecstatically enjoyed what the 'vulgar herd' had thrown aside with a sneer or a laugh; and roundly and decisively assert that the world was not worthy of such magnificent genius. As for the authors who shed their light within the contracted circle, they are commonly those who have labored strenuously for a wider fame and been disappointed.

"We will not say that popularity is a test of excellence. That would be an obvious error, contradicted by every-day experience and many lessons in the history of literature. But we think the facts will bear us out in saying that genuine works of genius of the highest order do ultimately obtain the full measure of acceptance and appreciation among all people of ordinary intelligence. A Milton may sell an immortal achievement like 'Paradise Lost' for five pounds, and die unhonored and almost unknown; while wretched rhymesters become laureates and bask in the beams of a Court. But millions in subsequent centuries will read the sublime story, and mingle the choicest lines in the speech of daily intercourse. The blind old Homer may wander from one country to another, a friendless minstrel, but the ages will repeat his glorious song.

"Shakspeare never wrote for the 'select few'—his genius irradiated to all mankind, and his phrases trip upon the tongue as 'household words,' which, as we write, we can scarce refrain from giving a place. Turn, then, to Goethe and Schiller; and where will you find the German who can read, or the foreigner who has made himself familiar with the speech of the 'Vaterland,' who has not perused some emanation of those mighty minds? Tasso's songs still linger on the lips of the Venetian gondolier, and even Dante's verses are not too lofty for the love of all his countrymen. So, in all lands, civilized or half barbarous, the great genius has the largest fame and is the most widely appreciated.

"As intelligence spreads among the people, the talk of writing for the 'select few' becomes more palpably absurd. The best of living authors,

either in prose or verse, are the most popular. Dickens has the most numerous audience, and who will say that the man whose books one may read twenty times over without weariness—who has drawn more tears to the eyes and laughter to the lips than all the writers of the day together—whose characters people the sidewalk and sit by the hearth—whose sentences, humorous or pathetic, are continually occurring to us in every-day conversation—and whose tremendous satires upon ancient abuses have proved him a giant among reformers, more potent than all the orators who have spoken in England for progress—has not the highest claim to superlative excellence? And around that great name clusters a constellation of splendid genius, which is admired by tens upon tens of thousands of readers. Away then with the cant about writing for the 'select few.' It is the plea of small-souled mediocrity, envious of a fame which is denied to their inferior minds. In these days the loftiest genius may be assured of the widest appreciation, while it is also found addressing itself to the million." *

The above common sense and admirably written communication is so much in accordance with my own sentiments, frequently expressed in the columns of this magazine and elsewhere, that it affords me much pleasure to lay it before the profession. In connection, it may be said, no poorer compliment can be paid by writers to the intelligence of their readers than to think that they are not expected to devote time and attention in the preparation of their communications, so as to clothe their ideas, if they have any, in plain, comprehensive language; or to suppose, by the employment of unmeaning and ambiguous terms, that the most puerile and common-place matters will be received as unexpected, wonderful, and mysterious revelations. And lastly, there can be no greater evidence of vanity than the intimation that, if a few understand and explain their meaning to the world, they are satisfied, as their work is done. This is said as a journalist, who has more at heart the interests of his profession and literature in general, than hesitation in directing attention to existing defects, which can and should be corrected.

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THE DENTAL REVIEW—APRIL.

"THE NITROUS OXIDE GAS AS AN ANÆSTHETIC IN DENTAL OPERATIONS. By RICHARD COOPER HOPGOOD.—Since the trials of the nitrous oxide gas as an anæsthetic in dental operations, at the National Dental Hospital, in December last, fully reported upon by Mr. Rymer in the January number of the *Dental Review*, London, I have felt great interest in the subject, and have been led to make further experiments; the particulars of which experiments I beg to append:—

"1. A young man, nineteen years of age, of rather a delicate and nervous temperament, inhaled some two gallons of nitrous oxide gas from a bag, the inhalation occupying about fifty seconds. At the expiration of this period, he threw down the apparatus, and commenced laughing immoderately. The laughter lasted for three minutes without cessation, and the effect then passed off, with the exception of leaving him in an

unusual state of exhilaration for some hours subsequently. I may observe, in reference to this person, that I am convinced the nitrous oxide cannot be made available for the production of anæsthesia, as I have tried it with him upon several previous occasions, and always with a like result as above.

"2. The next patient was a strong muscular man, of nervous temperament. He inhaled the gas for about seventy seconds, when I removed the tube from his mouth, and he remained quiet for a few seconds; but immediately afterward he began laughing excessively, and threw his limbs about in a manner to render it impossible to hold him sufficiently still to ascertain the pulsation. The plethoric tendency of the patient would have made it unsafe to allow him to inhale a greater quantity of the gas than he had already done, and so the bag was removed. It is remarkable that the person last alluded to had complained of pain in the side for some months prior to taking the gas; but he assured me, some weeks after the inhalation, that he had since been *entirely free from the pain.* Whether this is attributable to the exhibition of the nitrous oxide or not I am unable to say; I can only record *the fact.* It is as well to mention that the experiments were conducted (as I consider they always should be) in the presence of a third party—a qualified practitioner.

"The two cases now recorded are examples of individuals in which the attempt to extract teeth under the influence of nitrous oxide would be hopeless. As far, however, as my limited experience goes, I believe these to be exceptions to a rule, and that in most cases the proper exhibition of the gas will enable the operator to remove teeth painlessly.

"Great caution is necessary in giving the gas. The state of the patient's health should be previously ascertained, because, let it be noted, that the circulation of the blood goes on with greatly increased rapidity while under the influence of nitrous oxide. On this point the reader is referred to the able article of Dr. Ziegler in the DENTAL COSMOS, December, 1863.

"A peculiar case is mentioned by Pereira in his *Materia Medica.* The patient inhaled the nitrous oxide, and afterwards suffered the inconvenience of a complete perversion of taste for eight weeks. The same author observes that certain serious effects on the brain and lungs have occasionally followed the inhalation of the gas in mere common experiments.

"It seems strange that the nitrous oxide should have been so generally, even recklessly, employed of late in America, as our transatlantic brethren are not wanting in knowledge as to its powerful and uncertain effect upon the system.

"On the 13th of October of last year, the Odontographic Society of Pennsylvania, in discussing the subject of 'Anæsthesia,' entered at some length into details regarding the nitrous oxide. The observations of the members are too lengthy to quote in this paper; but I would refer your readers to the very interesting report contained in the DENTAL COSMOS for November. It does not seem that the members then considered the inhalation likely to be attended with dangerous consequences, and the gas having been made in large quantity before the meeting by Professor Morton, many of the gentlemen present inhaled it.

"One of the principal drawbacks to the use of nitrous oxide in England has been the time and trouble required to be expended in its manufacture. In America a readier process appears to exist, for, in his paper upon

anæsthesia, Dr. Tees, referring to the gas, says: 'The apparatus for manufacturing it in large quantities can now (October, 1863,) be obtained at the dental depots.'

"It is likely this discussion of the subject, together with the fact of an apparatus being available for the easy production of the nitrous oxide, stimulated the profession to a free use of the agent, and very little attention appears to have been given in discriminating as to the desirability of exhibiting it to persons in sound or unsound state of health. Hence, the only wonder is that, as yet, but a single case of death has been recorded in America from its use. This one case, however, ought to act as a warning, and proves that Dr. Odling's doubt of its absolute safety was well founded. The case was that of Mr. Samuel S. Sears. At the inquest held on the body, the dentist who administered the gas was exonerated from blame by the jury, who, nevertheless, appended an opinion that an indiscriminate use of the agent ought not to exist. Dr. McQuillen's article on this case, in the February number of the DENTAL COSMOS, is one well worthy of perusal.

"In comparing nitrous oxide with other anæsthetics, we have several points in favor of this gas, as have been shown in other communications on the subject, and yet, from all the papers and information I have read and obtained from friends, I must say this medium of producing anæsthesia is anything but satisfactory. At the same time, I think it is well worthy of further judicious trial and experiment. From the number of experiments made in America, with but one unfortunate case, it seems folly to drop investigation into the subject, as the utility of such an agent, if it is anything like as innocent as supposed by most experimentalists, would be a great addition to the Dentist's Materia Medica, and also a very great boon to suffering humanity; the extraction of a tooth being looked upon by not a few of our patients as some frightful ordeal, which must come sooner or later."

ODONTOLOGICAL SOCIETY OF GREAT BRITAIN.—The following is the concluding part of an appropriate address delivered by Edwin Saunders, Esq., President of the Odontological Society, on taking the chair, at the monthly meeting, Feb. 1, 1864:—

"Our Society has a twofold object: to promote the science and the art of our profession, and to facilitate social intercourse among its members. In proof of the extent to which the first part has been accomplished, I need only refer to the volumes of 'Transactions,' which contain valuable contributions in both departments, and notably to that very handsome volume which has just been issued, and which, whether the variety and excellence of the contents or for the manner in which the publishing committee have done their part, cannot but command our unqualified commendation. Where all are of so high a standard, it would be difficult to particularize; but I may say of one of those papers, which deservedly bore the prize placed at the disposal of the Society by the liberality of a former President, that, by the audacity of its speculations, and the delicacy and ingenuity of the experiments on which they were based, it would have done honor to any of the scientific bodies of this country.

"Much practical wisdom and many valuable suggestions are elicited in the discussions and minor communications at these meetings, a field which

has not yet reached its limit of cultivation, and of which I hope to see a further development during this session.

"Nor can the Society be said to have been less successful in the accomplishment of the second object contemplated in its formation—the promotion of social intercourse among its members. The tendency of all professions is to segregate men into sections, to subjugate their minds to one particular mode of thought, and thus, more or less, to unfit them to mingle in the world at large. But more especially is this true of a specialty like ours, which involves much physical fatigue and much petty anxiety, unrelieved by any great variety in the cases that come before us, or any great scope in their treatment, and all this conducted within the same four walls, and without the stimulus and exhilaration of change of air and scene. Such a profession, sedulously followed, is exceedingly apt to produce an effect analogous to that of using one eye, or of what is called 'working in a groove;' and it is only when compelled to break through the routine thus contracted that we become conscious of the depth of the groove and of the difficulty of freeing ourselves from its trammels. We then become aware how desirable is the cultivation of some pursuit other than that to which we are professionally bound, and that periodical relaxation which affords a renewal of life to the soul amid all that is grand and ennobling in nature or art. Then, again, in our consulting-rooms, we are somewhat of autocrats, where our dictum is law, sometimes with very distinguished and learned personages; and unless a man be possessed of great humility of mind and much given to self-examination, he may soon come to entertain an overweening opinion of himself and his doings. To counteract all this, I know no better means than such a Society as this, where a man may try a passage of arms with his fellows, and find how many there are possessed of equal skill, energy, and intelligence with himself. It may be that he will thereafter retire a sadder but he will certainly be a wiser and a better man, for he will thenceforth speak kindly and with liberality, and not disparagingly, of his brethren, and hence will arise what I will call an unwritten code of ethics, which will make us more respected by the world. We sometimes complain that our profession does not hold that place in general estimation to which the character of many of its professors would entitle it. We cannot too often be reminded that this will depend on the individual character of its members. When the happy time shall come, as come it will, if this Society continues its career, when, earnestly striving to do the best that in us lies, in place of detraction and disparagement, we shall delight in a liberal and enlightened appreciation of each other, or, if we indulge in harsh judgments, they shall be severe only on ourselves; when those who have gained the world's ear and confidence shall encourage those who are still in their early struggles, and those who climb shall not grudge the success of those who are before them, and who have borne the burden and heat of the day; when, in short, we shall cease to worship what Carlyle calls 'the everlasting Ego,' the world will not be slow to recognize our merits or to seek our alliance. Thus acting, and thus only, we shall be respected, for we shall show that we respect ourselves; and, enjoying in still larger measure the confidence and the friendship of the foremost practitioners of the sister arts of medicine and surgery, we shall have no cause to be ashamed of our profession, and shall be able to say of our Society with equal pride and truth, *Emollit mores, nec sinit esse feros.* (Applause.)"

The gold medal offered by John Tomes, F.R.S., for the best "ESSAY ON THE PATHOLOGY OF DENTAL CARIES," has been awarded to Mr. W. K. Bridgeman, of Norwich, by a committee of the Society appointed to decide upon the relative merits of the different essays submitted.

The non-receipt of the English dental journals during the past year has denied the opportunity of presenting to the profession in America any account of this paper and other interesting communications, which appear to have been read before this Society. As they have again made their appearance, it is trusted that the arrival will be more regular in future.

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BRITISH JOURNAL OF DENTAL SCIENCE—MAY.

"ON LATERO-PALATINE ABSCESS. By SIDNEY LONGHURST, ESQ., L.D.S.—I am not aware that this disease has ever received, in any work or by any writer, especial notice or comment. That it is worthy of distinctive remark among the common cases of dental periostitis and abscess I feel satisfied, from the many instances which have come under my own observation.

"The affection, as the name implies, is characterized by a swelling of the plastic integuments of the palate, by the intro-deposit of pus. Its peculiarity is due to the fact that, no matter in what part of the vault it may be established—anteriorly, posteriorly, or laterally—a lateral incisor will almost invariably prove the excitant.

"It would seem difficult to assign to this singularity a cause. For some time I was disposed to attribute it to the relative shortness of the fangs of the laterals, together with the frequency of their position being slightly depressed, and within the arch of the other teeth. Circumstances which would tend to bring the apices of their roots nearer to the surface of the palate, and hence, that whenever a disposition to periostitis was evinced, and the suppurative stage brought about, the pus would probably find a more facile channel for escape by the palate, than through the labial alveolar plates, as with the other teeth. This supposition I have more recently been inclined to dismiss, from having on one occasion, for the cure of a case, extracted one of the largest and longest laterals I ever recollect to have seen, without any corresponding depth of the vault being apparent

"The palatine fangs of the superior molars—of which fangs it may be remarked *en passant* are far more liable to abscess than the two buccal—as well as the bicuspids and centrals, are occasionally the seat of abscess simulating this disease, but less frequently, and in a form less severe. Seldom growing to any great size, and usually situated close to the offending tooth, rendering its diagnosis easy and certain.

"In the present affection the proximity of the swelling to the lateral is rather the exception, its site being often remote. I have even once or twice found the channel conveying the pus burrowing insidiously backward along the whole course of the vault, and discharging its contents over the soft palate into the throat, causing the patient considerable alarm, from ignorance as to its source. It more frequently stops midway, bearing to the side of the tooth implicated, where, as the pus is formed,

it continues to swell from the size of a small pea to that of a shilling. Sometimes taking a crescent form, and so involving one-half of the palate. Ever and anon throwing a part of its contents into the mouth through a small fistulous opening, and again, for awhile, remaining passive, but rarely exhausting itself or working its own cure.

"The condition of the lateral to which it owes its origin may be various. It may arise, first and foremost, from an irritated pulp, from injury by a blow, from caries, necrosis, abrasion, a pivot, or a defective plug; in fine, from any cause through which ordinary periostitis may be excited. A few cases may serve as an illustration.

"About three years ago a surgeon asked my opinion as to the cause of a small swelling near the centre of the palate, which was constantly troubling him by its bursting, and emitting sweet sanious matter. I diagnosed the right lateral. There was no tenderness worth notice, but it exhibited a slight bluish tinge, evidently from incipient disorganization of the pulp. As the annoyance was thought by him hardly sufficient to warrant drilling into the pulp, he resolved to bear with it, and to return if it increased. He did not, however, call again till after a lapse of about two years. The abscess had enlarged to the size of a sixpence, and the lateral, which had become loose and black, he was anxious to lose. On its removal the abscess at once collapsed, and soon all was well.

"*Case* 2 was that of a military man. The abscess on the palate was about the size of a fourpenny piece. The right lateral, which carried two apparently excellent fillings, had of late become extremely painful. He was himself cognizant of its being the offender, and was desirous of its summary extraction.

"*Case* 3 was that of a gentleman with a swelling of about the same size and position as in the last, but from which there had as yet been no discharge. The right lateral had, with the other incisors, been worn down by abrasion, exposing in this tooth the pulp to atmospheric impressions. Periostitis had been excited and disorganization of the pulp, which, on the extraction of the tooth and excision of its crown, emitted the characteristic fetid smell. This, could permission have been obtained, offered a fair case for Hullihen's operation.

"*Case* 4 was a domestic servant. The source of this was the left lateral, which retained an amalgam plug, but which had long caused uneasiness. No swelling was perceptible on the roof of the mouth, but pus found its way over the soft palate into the fauces, discharging it in considerable quantities every few weeks, which always for a time relieved the uneasiness of the tooth.

"*Case* 5 was a nurse. The abscess was similar to that of Case 2, but proceeded from the root of the left lateral, which was decayed and tender.

"*Case* 6 is one exhibiting several points worthy of note. The left lateral was the proximate cause of advice being sought. It had for five or six years carried two small plugs, without exciting any untoward symptoms. But the tooth had subsequently taken on periostitis, which resolved itself into a common labial alveolar abscess. This discharged its contents, and again healed up without interference, but only to show itself in a more troublesome form. The festooned edges of the lingual gums of all the front teeth became pale and thickened, and sanious matter was constantly oozing from between them and the teeth, until the lateral was extracted. A somewhat singular feature of the case is that I had some time

previously pivoted the right lateral, which up to the present has never given the least annoyance.

"It would seem that the mischief attributable to the upper laterals in certain abnormal conditions, may find expression in a form yet more severe, and in a locality still more obscure, namely, in the antrum. On one occasion I extracted the roots of all the upper teeth on one side, from canine backward, but it was not until the lateral was removed also, that the discharge of thin bloody mucus, which had long escaped in small quantities from the left nostril, was effectually checked. This patient had, from the first, from her own feelings, referred to the lateral as the cause. But as it was, apparently, one of the few useful and sightly teeth she possessed, evinced little sensibility on percussion, and being unable to account for its having any connection with the antrum, I preferred sacrificing all the stumps before it. Dr. McQuillen, on recently citing a case of diseased antrum, in which this tooth seemed implicated, concludes by writing —'The most remarkable peculiarity about this case is the apparent connection of the lateral incisor with the antrum. As a general thing, the cavity does not extend beyond the fang of the first bicuspid. But judging from the freedom with which the broach passed out of the foramina a considerable distance, and the analogy between the discharge through the pulp cavity and the opening into the antrum, it is reasonable to infer that such a connection does exist.'

"It may be the subject of remark as to why, in some of the above cases, so little effort would seem to have been made to save the teeth. But little certainly was made, not merely because little solicitude was evinced by the patients, but because my own confidence in a satisfactory conservative treatment, especially when the disease has been allowed to run on to a chronic stage, is not very high. As a matter of course, if the tooth be useful and sightly, and the neighboring teeth perfect, it is worthy every effort to retain it, otherwise I regard the attempt as unadvisable.

"If we except the peculiarity which has prompted this paper, there is, perhaps, no disease of the teeth the pathology of which is better understood than that of alveolar abscess. Still I venture to add, there is no one by which in our treatment we are so frequently baffled, and against which we may strive with so poor a chance of permanent success. This will not seem remarkable when it is remembered that that portion of the fang encircled or bathed in pus has lost its vitality—it is, in fact, dead. That it will be again embraced by a healthy periosteum, and recover its pabulum of life, is a hope somewhat feeble and forlorn. The power of the periosteum or pulp to secrete pus may become exhausted and dried up, and so one troublesome symptom cease. But a relict of the disease remains, in a fang in part dead, an extraneous matter which healthy tissues rarely tolerate long, and of which, sooner or later, nature will again bestir herself to loosen and cast off."

"Reflections on the Cause and Treatment of some Forms of Irregularity."—At the monthly meeting of the Odontological Society held May 2d, 1864, Mr. Cartwright read a paper on the above subject, in which "he said irregularity in the position of teeth in the human subject was the result of a departure from the normal type, in a greater or less degree, as regarded the form and capacities of the jaws. Teeth

were always normal as to size, *i.e.* there was no evidence of teeth having at all degenerated in external form and general proportions when compared with teeth of considerable antiquity; but the old skulls which were brought to light generally exhibited full capacity in the maxmillæ. It might, therefore, be fairly assumed that irregularity, although expressed by, did not depend so much upon the teeth as it did upon absence of the proportionate development in the maxillæ, and, consequently, want of space in the bones of the jaws might be defined as the true cause of irregularity in the position of the teeth in the majority of instances. By what legitimate line of reasoning could they arrive at the nearest approach to a satisfactory explanation of that want of capacity in the jaws of people of certain communities? Experience had shown that irregularity was a common phase, not only among ourselves but in Europe generally, and in the mixed European populations of the colonies, while it was an uncommon phase among many, if not most aboriginal people and tribes, and also the inhabitants of particular districts and localities. Irregularity was common in most highly civilized communities, and especially so among the upper and middle classes, and was more constant among the inhabitants of towns than among the inhabitants of agricultural districts. The normal types of the jaws were the round and the parabolic; the abnormal, the elliptic, the contracted, and the disproportionately large and angular. It was a question of importance to consider whether the alterations in the form and size of the jaws might not be accounted for as resulting in a process of breeding. From the results attained by high breeding in animals they might reasonably argue that small jaws might be a characteristic of breed in certain conditions of life. If they compared two types of human beings represented by the upper class in the one case, and in the other by a large class, of which the prize fighter furnished an apt example, they would find as a rule in the first, finely formed and delicate features, oval face, thin aquiline nose, thin or well-shaped lips, a small oral orifice, high and capacious forehead, well pronounced chin, ears small, and neck long; the ankles, wrists, feet, and hands small; with an expression in which the intellectual predominated over the animal; while the other presented exactly opposite characteristics. Besides those opposite types there were many varieties which exhibited forms of irregularity which admitted of distinct classification, occurring more especially in the middle and upper classes. They embraced those forms of the jaws which were hereditary, those resulting in congenital malformation, and those peculiar forms showing an excess or deficiency of the whole or portions of the maxillary arches, and the malposition and malarrangement of certain teeth. One type of irregularity was an undue prominence of the anterior incisive aspect of the superior maxillæ with much projection of the teeth, and this form was not always accompanied by contraction of the sides of the maxillæ. The lower jaw sometimes, in those cases, was, in the form of its anterior aspects, the reverse of the upper, being flattened while the teeth inclined into the mouth; but this latter condition was neither an example of hereditary or congenital fault, it being usually the result of a bad habit of thumb-sucking, the knuckles being pressed against the lower teeth while the inside of the upper part of the thumb was brought against the back of the upper teeth, acting the part of a double lever. Hereditary irregularities applied to transmitted peculiarities as regarded the conformation

of the jaws, and also to transmitted irregularity of particular teeth, the absence of certain teeth, or the presence of supernumerary organs. Congenital malformations of the maxillæ were abnormal forms, *per se*, occurring usually without any hereditary predisposition. Mechanical irregularity was not so much dependent on the form of the jaws as on the position of certain teeth, whereby obstruction and displacement was produced by interlocking or misapplied apposition. They might next consider in what way irregularity of the teeth was due to causes over which they had control, and in what way such irregularity might best be controlled. They heard much nowadays of contracted jaws, and no wonder, for they were common enough; but contracted jaws were accounted for by many professional men, and commonly by the laity, as resulting from premature removal of the first teeth, and that maxim he did wonder at. It would be well to consider what was meant by contraction of the jaws in the sense implied. A truly contracted jaw he took to be a general diminution in the capacity of the bone, especially of the alveolar portion, and a lessened arch or circle. Practical deduction, from experience, inclined to the conviction that temporary teeth had no part in preserving the form of the jaw, and that their removal did not in the least interfere with its due development and growth. The author went on to show that the great majority of cases of irregular permanent dentition might be prevented or remedied by the removal of two, three, or four permanent teeth; but if such a solution of the difficulty were objected to, then recourse must be had to mechanical pressure to compel the teeth into a wider circle—a process that required often very much time. After referring to a large number of models illustrating the points referred to, Mr. Cartwright concluded by saying that his object was to draw the attention of the members of the Society to the notion that it was next to heresy to extract teeth for the purpose of cure of irregularity, and to urge them not to accept the proposition without giving due consideration to so important a problem; above all, not to assist in propagating a questionable theory by assenting to the idea that the temporary teeth had to do with the eventual size and shape of the jaws, and that their removal was a source of contraction, or that it was bad practice to sacrifice permanent teeth in order to make room for the regular placement of the rest. He could not help feeling that the science of dental surgery had suffered by the ill-judged way in which the term 'contraction' was freely used and paraded before the public, and that an old, correct, and honest practice had been unjustly questioned by the introduction of an idea which was, in its working, not successful when weighed in the scale of experience.

"Dr. Thomas Ballard.—Mr. Cartwright has been kind enough to call on me to make some remarks upon this occasion, and I shall be most happy to do so, inasmuch as the subject of the mechanical distortion of the jaw, as Mr. Cartwright has defined one of his divisions, has been one which has occupied my attention for some years past, not so much with regard solely to the deformity of the jaw, but because the evil which causes that peculiar kind of deformity has very serious effects on the health of children, and, in fact, by injuring the health of the child, prejudices that of the future adult. My attention was more particularly first directed to it by examining idiots. I found that, for the most part, idiots have their jaws deformed in one or other of the various modes which Mr. Cartwright has included under the head of mechanical distortion. I

would say, having listened with very great pleasure to his paper, that I think that in many cases which Mr. Cartwright would include under the congenital and hereditary form of distortion, the mechanical explanation might be applied rather than these. I have seen a very great many babies born during the last twenty years, and I have never seen one born with anything wrong with its jaws. except a few cases of cleft palate, the nature of which is well understood and is distinct from the present subject; although I have seen a projection of the upper jaw in a child of fifteen or eighteen months old, when it had been kept all that while sucking at its mother's breast, perhaps not having any other food; and it has been very curious to remark how exactly the deformity of the upper jaw followed the pressure of the tongue under the nipple, so that, even at that early age, the jaw has been considerably pressed forward. Well, then, never having seen an infant born with any deformity of its jaws, I have seen hundreds of children whose jaws have been deformed by the continued acts of sucking, which is the way in which a child is usually fed. Most children suck, and it is by their sucking and sucking under difficulties that their jaws get deformed. That is a point which has never before had sufficient attention drawn to it, and it is one, I think, of the very greatest importance. With regard to hereditary deformity of the jaws, I think there may be considerable misapprehension upon that point. I had a case a year ago, which very much interested me in that respect, which I will briefly narrate. I was attending a family of children for the scarlatina, and, finding them weak, I was as usual on the *qui vive* about their being, what I term, 'suckers,' that is, having a 'retained habit of sucking:' and, seeing that the elder child's under jaw was drawn in advance of the upper, I at once pronounced her to be a 'sucker.' I asked the nurse if she had a sucking habit. Of course she did not know what I meant, and she said 'No.' Then I requested that she should be watched, and explained what I meant, and, at length, I detected it myself. When the child was in bed and about to go to sleep, she put her hand into her mouth, so that the weight of the hand hung upon the lower jaw, and in that way the lower jaw was drawn out. The nurse objected to my explanation of the deformity, because she said, the grandfather of the child, a nobleman, had a similar deformity, and that it was a family feature—therefore that was the explanation of it rather than mine; but she very kindly accepted my views and promised to correct the habit by tying the child's hand up. The family left town, and I did not see them for a year; on their return the nurse called my attention to the cure she had effected. The child had been cured of her sucking habit and the jaw had returned to its proper position, the family trait being completely lost; and it remains lost altogether. I thought that was a good illustration of the fallacy of the doctrine of hereditary deformity. Of course such things may be. I do not mean to say there is no such thing as hereditary deformity nor congenital deformity, but I think both of them are very much less common than mechanical deformity. This cause of mechanical deformity is one that is in very great operation, and is of very grave importance, because you may be endeavoring to correct a deformity by your mechanical means, and during all this time the child may be working against you and reproducing it. I might allude to a case treated by my friend Mr. Vasey—I am sure he will excuse me doing so. It was that of a young lady whose under jaw projected. At one time I know it was thought

to be successfully treated, but at the present time the young lady is very much deformed indeed, and it is a source of considerable regret to her parents that she should be so. The explanation is plain, and the young lady is well aware of it. Up to within a very recent period she has had the habit, when going to sleep, or when she was alone, thinking, or doing anything, of placing the palmar surface of her thumb on her lower incisor teeth, so that the whole weight of the arm and hand hung upon the jaw, consequently all mechanical contrivance directed to the correction of the deformity was useless, and instead of being a successful case, as it appeared at first, it turned out to be unsuccessful. I think there are many cases of that kind, where the dentist is at work correcting the evil, while the patient is at work constantly producing it. Thumb-sucking is the form that this habit of sucking is generally supposed to take, and that is the name that is generally mentioned in connection with these habits; but really thumb-sucking is but one variety of it. Deformities are caused by thumb-sucking certainly, that is, by the thumb being pushed up against the palate and thereby making a high arched palate, pushing the incisor teeth out forward, or, it may be, by two fingers placed against the hard palate, which is a very common form. In that way the jaw is pushed out more bodily, and instead of getting the triangular jaw, you get a jaw of which the whole arch is pushed out, or you may have the same sort of thing, as I said before, applied to the lower jaw, when you get the lower jaw pulled out. There is another form, which is the most difficult to detect, that is, 'sucking the tongue,' the most serious evil of all, I believe. A child gets a habit of sucking its tongue, and it may be continued for any length of time. I have known cases in which it has continued up to adult age, and even to middle life people still constantly sucking their tongues. When they get quiet, or are going to sleep or thinking about anything, the tongue is pressed, as a young lady explained to me, the other day, like a stick against the upper jaw and constant pressure is made, so that persons who have that habit, have the jaw actually pushed out—not as it is with the thumb, but the whole arch of the jaw pushed out. It is very difficult to get that acknowledged, and I do really think the testimony of the individuals themselves or the testimony of their parents may always be questioned. A young woman was brought to my room a few weeks ago, twenty-two years of age. She was supposed to be suffering with phthisis. Her mother came with her. When she entered the room, I saw at once she had had the habit of sucking her tongue, and I asked if it were so. The mother said, 'Oh dear no, sir, never; I am quite sure she never had such a habit.' I explained what I meant. I said, 'I think she must have had.' 'Oh dear no, sir, she was quite sure she never did anything of the kind.' The young woman said, 'Yes, I did, mother; I do it now, I always do it.' I replied, 'I supposed so.' So again with the individuals themselves. I might refer to one of these models—that model (showing.) The young woman from whom that is taken suffers all the peculiar weakness and delicacy of health which I connect with this habit. She has no recollection whatever of having sucked, but, upon looking at her hands, both her index fingers are arched, showing that these index fingers fit exactly in there, (referring to the model,) thus leaving no doubt that she had sucked a considerable time, during her childhood, both her index fingers. I say, the testimony of individuals themselves or of their parents is not really to be trusted.

When such a deformity as that exists, I believe you may fairly infer that a person has been in the habit of sucking. This is a most interesting model, because it shows the deformity in its very earliest stage. The child was four years of age, and she died a victim to the habit of sucking two years after that was taken. Here is one which shows a very considerable deformity (pointing.) In this case it was done with the knuckle, and here is a model of the finger with which the child did it. Here is the model of a little girl who has sucked her thumb for years. I have been several years endeavoring to cure her of the habit. She is weak, and thin and pale, suffering all the peculiar effects from it. You will see how the lower incisors are pushed in, and the central incisors are serrated. The lower teeth are pushed in, and the upper pushed out. Here is a very well-marked case of thumb-sucking. All these are cases that have come under my own observation, where *I know* the deformity is caused by this habit. You will see in this case how exactly the thumb fits into the palate, this lower jaw seems to have been pushed in by the weight of the hand. This person is constantly suffering from headaches, and if she were a little worse she would be in an asylum, and called an idiot. Here is a case of tongue-sucking, and the person from whom this was taken is at present in an idiot asylum. He is there because he has paralysis of the extensor muscles of his lower extremities, and has never been able to walk. His intellect is rather defective, but if he could walk, he could keep his place in the world somehow or other, and need not be in an asylum. I have several other models at home illustrating the same points, but I think these are sufficient to show all that I need say upon the subject. They show that which I wish to explain. I do not know anything else which children do with their mouths that can deform them except sucking."

It is somewhat surprising to find a dental practitioner of any experience entertaining and advancing such views as those expressed by Mr. Cartwright in relation to the extraction of deciduous and permanent teeth. The *facts* are so unquestionable, and the reasoning so plain and philosophical in support of the opposite side of the question, and are so well understood by the profession, that it is not necessary to defend them in any other way than by simply stating that the loss of the teeth by giving the jaws less to do in the commutation of the food, would alone of ne cessity tend to retard their full development. Dr. Ballard's views are novel, in genious, and reasonable.

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PERISCOPE OF MEDICAL AND GENERAL SCIENCE IN THEIR RELATIONS TO DENTISTRY.

BY GEO. J. ZIEGLER, M.D.

Teeth—(Continued).—"*On the nature of teeth and of the tooth structures.*—It is impossible for any one who has studied anatomy, even in the most superficial manner, not to feel interested in Homology. Every student delights in tracing out the different organs in the several classes which correspond in essential structure and mode of development, or are homologically related to one another; so one of the highest aims of the minute anatomist is to define the elementary structure or components of the different textures of which the different organs of the body are composed.

"The homological relations of the teeth as organs of the dentinal tissues have not yet been positively determined, and several different views have been taught and entertained by high authorities upon this very difficult subject.

"Teeth have been considered to be part of the skeleton. Many think they are closely allied to bone.

"Teeth have been regarded as papillæ, the enamel corresponding to the epithelium. The dentine and pulp to the papilla itself. According to this view the enamel lies external to the basement membrane, and the dentine answers to the submucous tissue. A certain general agreement in arrangement and mode of growth has been admitted to exist between teeth and hairs. Prof. Huxley admits that teeth are homologous with hairs; but he thinks that both these organs are dermic, and not in any part epidermic. He thinks that *all* the dentinal tissues are produced beneath a membrana præformativa, and considers that the enamel is developed not *upon* but *beneath* basement membrane. He thinks that scales and feathers may come into the same category, but would admit nails to be purely *epidermic.*

"Although upon a question so very difficult of investigation and so complex its bearings, I hesitate to express too positive an opinion, it is right that I should direct your attention to the different doctrines that are taught, and try to show which view receives the strongest support from a careful consideration of facts that may be demonstrated, and I regret that the conclusions to which I have been led differ in several important particulars from those held by many authorities on this matter.

"*Are the tissues of the teeth allied to epithelial or connective tissues?*—The first question we have to discuss is to what textures the tooth tissues are most nearly allied. A tooth has often been compared to bone, and it has been said that the pulp cavity corresponds to the Haversian canal, and the comparison has been made still more precisely. It has been said that just as we find a vessel in the Haversian canal, so we find vessels in the pulp cavity, and just as we have the canaliculi opening upon the walls of the Haversian canal, we have the dentinal tubes opening upon the vascular surface of the pulp. The fluid nutrient plasma passes along the canaliculi of the bone, and thus every part is nourished, and in dentine the canaliculi are the channels by which nutrient matter is distributed to the hard dentinal tissue. Let us consider if the tooth is more closely

allied to the *antler*, which is composed of bone, or to the *horn*, which, as is well known, is but a modified cuticular or epithelial structure. It should be premised that there are examples of teeth which are continually being removed and replaced by new ones, which grow up behind them or beneath the old ones, teeth which once removed are never replaced, and teeth which continue to grow regularly throughout life from persistent pulps, as it has been said. Some of these teeth are worn away as fast as they are produced, while otters' tusks increase in length as the animal advances in age. With reference to the tusk and the horn it will be remarked that both continue to grow on from the nutrient pulp. That tissue furthest from the pulp is the oldest, that nearest to it was only recently produced. The vessels of the pulp do not penetrate into the substance of bone, or the tusk, or tooth. Moreover, the oldest part of both organs is the narrowest, and as the creature grows the diameter of the horn and tusk which is produced increases, and if not worn away by friction the very same tissue which was formed in youth remains in old age. This oldest tissue gradually passes into that which was but just produced. Nor is it possible, as many have supposed, that the oldest horn or tooth structure formed is replaced by new. The very same matter remains throughout life, and undergoes little further change than desiccation. Even in very old animals, both horns and tusks continue to grow slowly. There are, therefore, important points connected with their mode of growth, form, and animal change, in which tusks and horns resemble one another. We shall presently consider if they agree in their minute structure.

"On the other hand, every part of the *bony matter* is penetrated by vessels. Even to its extremity the blood circulates. It grows in every part, nor is there the remarkable difference in diameter at its apex and base, as observed in the case of horns and tusks. It does not continue to increase as the animal advances in age, but, as is well known, drops off at intervals, and is replaced by an entirely new structure. The horn of the young animal passes uninterruptedly into the bone formed in old age; but the bony antler of youth is separated from that produced in old age by many entire organs which have successively been grown, developed, have reached maturity, died, and have been cast off.

"If any analogy exists between the pulp cavity of the tooth and the Haversian canal of bone, it is clear that the tusk and horn correspond not to the entire antler, but only to that small portion of bony tissue which surrounds each Haversian canal.

"If the elementary parts of which the bone is composed were calcified, a 'tusk' would result. But neither in mode of development, nor in structure, nor in growth, nor in its persistent character, does the antler agree either with horn, hair, tusk, or tooth. So far, therefore, it would appear that the hard calcified texture of which the tusk or tooth is composed corresponds more closely with that of the epithelial or epidermic horny tissue than with osseous texture. We will now discuss the position of the basement membrane of the tooth.

"*Of the basement membrane, or membrana præformativa.*—I propose now to refer briefly to the dispute concerning the position of the membrana præformativa. It is, however, necessary to remark, in the first place, that in no case has any such transparent membrane, as that supposed to exist, anything to do with the formation of the structure upon or beneath its surface. Its presence, as is well known, is by no means

onstant, and with regard to its actual existence in relation to any of the dentinal tissues, I regard it as certain that no preformative membrane has been actually demonstrated over the enamel, as Huxley asserts, between the enamel and dentine, as many observers hold, or beneath the dentine. That a transparent membranous-like structure may be raised from the surface of the enamel of a young tooth by the action of chemical reagents is perfectly true, as stated by Huxley; but it has been already shown that this is not a preformative membrane. It consists undoubtedly, as Mr. Tomes maintains, of the outer as yet uncalcified part of the columns or columnar cells, which take part in the formation of the 'enamel rods.' This, then, is but a *membranous appearance* produced artificially, not a natural membrane taking any active part in the formation of the enamel, or even a membrane beneath which enamel is deposited. I have already shown that there is a vascular membrane external to the enamel cells, but this does not hold the relation to the formed enamel tissue which the supposed preformative is said to possess.

"It is certain that no basement or preformative membrane exists between the enamel and the dentine, for in many instances the latter tissue actually extends into the former, as was first shown by Mr. Tomes, ('Philosophical Transactions.')

"With regard to the existence of such a structure upon the surface of the pulp—that is, beneath the enamel—I have already stated that as in the case of the papillæ of skin the cells seem to dip down, as it were, into the substance of the so-called sub-basement connective tissue. Still, there can be no doubt that the position of basement membrane, supposing it to be a necessary and constant anatomical structure, would be between the epidermis of skin and the modified connective tissue of which the body of a cutaneous papilla is composed. Most observers seem to have concluded that a membrana præformativa was an absolute necessity, without which different structures could not be produced; but these structures, it has been clearly shown, are the result of changes occurring in a special tissue, not in the so-called membrana præformativa, which is perfectly passive. It seems to me that such a membrane has no more to do with the *formation* of structures beneath it than the capsule of a seed with the formation of the seed itself. Membranes where they do exist are the most passive of structures. Neither the dentine, nor the enamel, nor the cementum, are formed by any membrane. The active matter concerned in formation in this, as in all other cases, is that part of so-called 'cells' which I have described as germinal matter.

"*The homology of the dentine, enamel, and cementum.*—Still the question of the situation of the basement membrane must not be thus dismissed or the real question at issue avoided. We will, therefore, proceed to the consideration of the larger question regarding the actual relation of the enamel and dentine to the tissue of which the pulp of the tooth is composed. Where in the tooth is the line situated at which the cellular or epidermic structure joins the dermic? Upon the determination of this question will depend the conclusion we accept as to the true homology of the dentinal tissues.

"I have advanced facts and arguments against the view that the enamel and dentine lie *beneath* basement membrane, and are dermic structures, and I have shown that there is great improbability in the view that the dentine itself is a form of connective tissue; but this part of the question will be more carefully investigated in the next section.

"It remains, then, to be considered if the dentine, like the enamel, is allied to an epithelial structure. This last is the inference, which, though widely differing from any now generally held, seems to me to receive the strongest support from a careful consideration of the whole question of the anatomy and development of the teeth.

"In many epithelial structures, as is well known, the cells or elementary parts upon the surface exhibit a difference in arrangement and form, from the deeper ones at least, as remarkable as that observed between the dentine and enamel. I look upon both enamel and dentine as calcified epithelial structure.

"*Of the enamel rods and of the 'cells' from which they are formed.*—The cells from which the dentine is formed exhibit analogy to elongated epithelial cells, and there are not wanting instances where the deep extremities of epithelial cells may be traced for a considerable distance, and may even be followed in 'sub-basement tissue.'

"In many cuticular structures great difference is observed between the cells upon the surface and those beneath, so that it would seem that the outer cells grew outward, while the inner cells grew inward toward the sub-basement tissue. It seems to me that in dentine and enamel we have a somewhat similar arrangement. These two tissues grow in opposite directions from the same point. So far from both the dentine and enamel being *dermic* structures, as Prof. Huxley concludes, they are really both *epidermic*, and that the enamel and dentine are both homologous with epithelium of cuticle, the first with the superficial, and the second with the deeper layer.

"Epithelial structures may often be traced into connective tissue, and it is therefore not surprising that, supposing the dentinal tissue to be modified cuticle, that it should be continuous with the cementum—a structure closely allied to bone. Just as we have bone projecting outward upon the surface, so we may have tissues, which, although formed upon the surface, extend for some distance into deep parts, and thus come into very close relation with them.

"The general arrangement of the dentine far more closely resembles that observed in epithelial than in bony structures. The hair grows from the surface of a pulp like the tooth. Many hairs and many teeth grow from persistent pulps. The pulp undergoes but slight change in size, although the bulk of tissue produced upon its surface is enormous. The vessels and nerves of the papilla no more penetrate to the extremity of the hair than do the corresponding structures pass toward the extremity of the tooth. There is, as has been shown, the strongest analogy between the growth of a tusk and that of a hair, and if we compare the textures of the two structures it is not possible to help noticing many points in common. It is not difficult to find in epithelial structure elongated epithelial cells applied to each other like the anatomical elements of the dentine. Nor do the so-called dentinal tubes present any serious impediment to the acceptance of this view, for it has been positively demonstrated that they are not tubes for the circulation of nutrient fluid, but are always occupied with solid matter. Moreover, as the elementary parts of the dentine advance in age, the soft solid matter in the centre (occupying the supposed tube) gradually undergoes conversion into dentinal tissue, just as the germinal matter of an epithelial cell gradually undergoes conversion into hard tissue as the cell advances in age.

"*Enamel.*—The cells which become the enamel grow from within out-

ward, and the distance from the so-called nucleus to the deepest part of the enamel gradually increases. The germinal matter ('nucleus') gradually moves outward, deriving its nourishment from the outer or upper surface, and producing formed material at the opposite extremity. This formed material takes the form of a prism, and its oldest portion—that is, the part nearest to the dentine—gradually becomes impregnated with calcareous matter. When the enamel thus produced has reached a certain thickness, the germinal matter (*nucleus*) dies, the tooth passes through the gum, and the vital changes occurring in the enamel cease forever. No new enamel is formed, but that produced is gradually worn away. But in the rodent incisors the formation of enamel like that of dentine proceeds from the persistent pulp. Nor is there any reason whatever for believing that the fully formed enamel is 'nourished' or appropriates nutrient matter. Doubtless it is permeated very slowly by fluids which preserve its hardness, but these fluids act only as similar fluids would act upon the structure if it was entirely removed from the body.

"Let me again impress upon you the fact that the formation of the enamel is complete, and ceases at an early period of development, while the formation of dentine continues throughout the greater part of life. The oldest part of the enamel is its deepest part, where it is in contact with the dentine. Its surface was the last part formed. The oldest part of the dentine is that nearest the surface of the tooth. In fact, the dentine grows from without inward, so that the part most recently formed is close to the pulp cavity. The enamel grows from within outward, so that the enamel of most recent formation is that which forms the outer surface. These two structures at one period of development actually grow in opposite directions from the same neutral point where each commenced to grow.

"*Cementum.*—With reference to the cementum, it should be remarked that this tissue is not formed until after much of dentine and enamel has been produced—in fact, not until the tooth has increased to such a size that the surface of the dentine of the fang, or the surface of the enamel covering the crown, comes into very near relation with the cells upon the inner surface of the membrane which forms the tooth sac. It has been said that this membrane becomes itself ossified, but the changes occur in a tissue which is produced beneath it, and which in certain cases is formed in very large quantity. Although some forms of cementum closely resemble ordinary bone in character, important differences may be observed, both in structure and mode of formation, in the teeth of man and many mammalian animals.

"The view of Prof. Huxley that, in a morphological point of view, the cementum is homologous with the enamel, seems to me incompatible with the following facts:—

"1. The cementum in the herbivorous tooth covers the enamel, and, in exceptional cases, it occupies the same position in the human tooth.

"2. Its formation does not commence until the formation of the enamel is completed.

"3. The character of the soft tissue (cells) which precedes the enamel is distinct from that which exists before cementum is produced, (tissue with stellate cells.)

"*Of the formation of the so-called intercellular substance of dentine.*—Intimately connected with the question of the nature of the dentinal tissues, is the question relative to the mode of formation of the so-called

intercellular substance; for it is obvious that if it can be shown that dentine agrees in its structure with cartilage and bone, and consists of cells and intercellular substance, it belongs to the series of connective tissues. If dentine is a connective tissue, without doubt it is formed beneath the line which corresponds to the position of basement membrane, and must be considered as a dermic and not as an epidermic structure.

"Although in my earlier lectures I have advanced facts and arguments against this view of the structure of connective tissues, it is necessary for me to consider the matter here somewhat in detail, particularly as regards bone and dentine. And first, let me consider how far the so-called wall of the dentinal tube, as distinct from the intertubular tissue, has a real existence. Those who maintain that the lacunal cell of bone and the dentinal tube of dentine possess special walls, seem to have overlooked the fact that the so-called cells of lacunæ and soft contents of the dentinal tubes become smaller and more contracted or shrink, as the tissue advances in age. It, therefore, follows either that what at one time was *cell wall* must become at a later period *intercellular substance*, or else the cell wall must shrink in consequence of the deposition of new matter upon its external surface. If the first view is accepted there can be no necessity for distinguishing cell wall from intercellular substance. If the last is received, the cell wall must, as it shrinks, gradually become puckered, which is not the case. There would be, moreover, upon this view great difficulty in explaining how or why the calcareous matter passes through an old condensed and puckered cell wall to be deposited outside it.

"The theory of the formation of intercellular substance as a process distinct from the production of cell wall is now generally received, but the advocates of the doctrine have met with terrible difficulties in the attempt to apply the theory in detail, and, like the supporters of many fanciful hypotheses, they avoid details which seem adverse to their favorite theory. This doctrine rests upon the most gratuitous hypothesis, that intercellular substance is deposited around and between cells. If such a deposition really occurred, it is surely reasonable to conclude that we ought to be able to find at least one example in nature in which such deposition was unquestionable; but not one has been pointed out by the many supporters of this favorite but fanciful doctrine. Let the reader suppose, for example, a number of spores of mildew arranged at a short distance from each other in gelatinous medium, holding in solution calcareous matter; let him further suppose that the calcareous matter was deposited between and around the several cells, he would then have a calcareous intercellular matrix, in which masses of protoplasm, each being surrounded by a distinct cell wall, were contained, and if he supposed the cells to have communicating processes, he would have a tissue much resembling bone. To some, such a theory may seem plausible enough, but let the reader further remember these facts:—

"1. That in the formation of bone cartilage, etc., the so-called cells are gradually becoming separated farther and farther from each other.

"2. That up to a certain period they are increasing in size, and that after this they diminish in size.

"3. That in ossification, the deposition of the calcareous matter occurs first in the very centre of the cartilage, not upon the surface of the cell.

"4. That 'intercellular substance' gradually increases as the tissue advances toward its perfect state, and that it exhibits differences in refrac-

tive power in the forms of lines around the cells, almost resembling laminæ in some cases.

"It will be observed by any one who considers these points carefully, that they are incompatible with the supposition that the intercellular substance is gradually deposited between the cells.

"Again, the deposition of this 'intercellular substance,' distinct from the cell wall and independently of the cells, involves one of the following suppositions :—

"1. The existence of an analogous substance in the blood itself; or,

"2. The possibility of the cell exerting some metabolic action upon, or converting the matter deposited from the blood into the peculiar and characteristic matter constituting the 'intercellular substance.'

"All attempts to prove the first position have failed. The second supposition is opposed to broad facts. It is well known that various matters may be deposited upon the outer surface of cells, as crystalline may be deposited upon any foreign substance placed in a strong solution of the crystalline material; but there is no evidence whatever that the cell exerts any mysterious metabolic action upon them. The matters deposited here must be simply precipitated from a solution, the cell wall being merely incrusted with them.

"I have shown in my earlier lectures that the so-called cell wall increases in thickness, not *by deposit upon its outer surface*, but by the successive deposition of matter upon it, so that it is caused to expand by distending from within the *inner surface.* The outer part, or that most distant from its centre, is invariably the oldest. If intercellular substance is deposited around the cells, it must be shown either that it gradually and evenly increases in every part of its substance, or in the part midway between the respective cells only, or upon the outer part of the cell wall; but neither of these positions have been supported by facts.

"The view involves, in fact, the existence of growth according to two distinct and opposite processes—the cell wall being increased by deposition from within—the intercellular substance being increased by deposition from without. The fact, that in many cases the so-called 'cell wall' does not exist as a structure distinct from the 'intercellular substance,' and does not differ from it in chemical composition or properties, renders such a position untenable, since it is unreasonable to infer that two layers of matter, in all respects the same, and contiguous to each other, should be produced by antagonistic operations, (deposition in a direction *from centres* and deposition toward centres,) while upon such an hypothesis, the objects fulfilled by the cells are not explained. If the cells take no active part in the formation of the intercellular substance, why are they constantly present while their process is going on?

"It has yet to be shown that the formation of any tissue peculiar to living beings, in a direction with respect to the germinal matter, proceeds from *without inward*, while there is not the smallest difficulty in demonstrating many instances in which deposition takes place from within outward. It is not in accordance with what is yet known to believe that so universal a process as growth occurs according to two such opposite and utterly incompatible processes as deposition toward, and evolution from, a centre.

"Hence, I cannot but feel that further investigation will demonstrate that the deposition of intercellular substance theory is erroneous."—(Dr. Lionel S. Beale, *Dublin Med. Press.*)

"*Assimilation of Isomorphous Substances.* — M. ROUSSIN has performed a series of experiments on hens and rabbits, in order to ascertain whether similarity in form and composition is accompanied by any peculiar physiological properties. In one series of experiments, he investigated this question with regard to the shell of the hen's egg. This contains 90 per cent. of carbonate of lime; and he endeavored to ascertain whether other isomorphous carbonates could be made to replace the lime-salt in the shell. Accordingly, some hens, some time before laying, were shut up in wooden cages, at a distance from the ground and from any wall, and were fed with potatoes and oatmeal, or with oatmeal moistened with water. With their food, the substances with which the experiments were made, were mingled. The result of these experiments was, that carbonates of baryta, strontia and magnesia, peroxide of manganese, protoxides of iron, zinc, copper, lead, cobalt, or the oxides of these metals, were readily assimilated by the hens and eliminated in the coverings of their eggs. Alumina, sesquioxide of iron, manganese, and the oxides of antimony were never found in the egg-shell.

"Another series of experiments had relation to the soft parts of the egg. The albumen and yolk yield, on calcination, a notable proportion of chloride of sodium. As the alkaline iodides, bromides, and fluorides are isomorphous with this salt, it was endeavored to ascertain whether, after their administration, iodine, bromine, or fluorine, would be found in the egg. Not only was this the case, but the quantity of these elements present in the egg was remarkably large. They were apparently distributed in equal proportions between the albumen and the yolk. Eggs containing bromine, iodine, or fluorine have no peculiarity of taste; and it is suggested that this observation may be made useful for therapeutic purposes.

"The administration of the alkaline iodides, and especially of the bromides, was accompanied by a singular phenomenon, viz., the gradual disappearance, in some instances, of the calcareous covering, in proportion to the increase of the above-named substances in the interior of the egg. This occurred in hens left at liberty, and having free access to carbonate of lime; and was not generally observed in strong birds with good appetite.

"In a third series of experiments, it was endeavored to ascertain whether arseniate of lime could be assimilated and substituted for phosphate of lime in the bones—the arseniates being isomorphous with the phosphates. The result was found to be that, when small quantities of arseniate of lime are introduced into the food of a female rabbit, the animal gives birth to young whose bony skeleton contains a notable proportion of arsenic, while their muscular tissue contains scarcely any traces. The arsenical compound is also eliminated by the urine in the form of arseniate of ammonia and magnesia.

"M. Roussin concludes from his experiments, that substances isomorphous chemically are assimilated and eliminated in a like manner from the animal economy, and may be regarded as isomorphous in a physiological point of view."—(*Gazette Méd. de Paris*, *Br. Med. Journ.* and *Canada Lancet.*)

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"*Essential Features of Life.*—MR. SAVORY, in a recent lecture before the Royal Institution, London, defined the essential features of life, when reduced to its simplest terms, as a state of dynamic equilibrium—a con-

tinual succession of waste and repair; the former being the conseqence of every act of mind or body, the latter the result of the various processes of nutrition carried on during repose. In a human body weighing 140 lbs. about a ton of various matters, solid, liquid, and gaseous, are received and assimilated during a year; yet the body appears exactly the same. Some organs, however, such as the teeth and hair, have a limited existence. This may be compared to the metamorphoses of insects. Life is maintained in a normal state when demand and supply are perfectly adjusted, consumption being ever proportional to the total energy exercised. A seed of a plant is in a state of dormant vitality, which the hibernation of certain animals closely resembles. The blood which we have in three stages or conditions—that of to-day in its perfect state, that of yesterday in its used state, and that of to-morrow in its preparatory stage—is the important agent in the nutrition or repair of wasted tissues. Its great organ, the heart, has also its due periods of work and rest or repair. The same is the case with the organs of respiration. In health an increased demand for power meets with increased supply. Hence the large size of the muscles of the arm of a blacksmith, and the greater development of the brain when the mental power is raised by education. The mutual sympathy existing between all the organs of the body is maintained by means of the blood and the nervous system; and by the action of the nerves on the blood-vessels, the varied phenomena of the countenance (pallor, blushing, etc.) are produced. In conclusion, Mr. Savory proposed to reduce the seven ages of man to three: Growth or development, when supply of nutrition to the tissues exceeds the demand; maturity, when the two are balanced; and decline, when supply falls short of the demand, and decay ensues."—(*Annual of Sci. Discovery.*)

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"*Reproduction.*—The student of nature wonders the more, and is astonished the less, the more conversant he becomes with her operations; but of all the perennial miracles she offers to his inspection, perhaps the most worthy of admiration is the development of a plant or an animal from its embryo. Examine the recently laid egg of some animal, such as a salamander or a newt. It is a minute spheroid, in which the best microscope will reveal nothing but a structureless sac, inclosing a glairy fluid, holding granules in suspension. But strange possibilities lie dormant in that semifluid globule. Let a moderate supply of warmth reach its watery cradle, and the plastic matter undergoes changes so steady and purpose-like in their succession, that one can only compare them to those operated by a skillful modeler upon a formless lump of clay. As with an invisible trowel, the mass is divided and subdivided into smaller and smaller portions until it is reduced to an aggregation of granules not too large to build withal the finest fabrics of the nascent organism. And, then, it is as if a delicate finger traced out the line to be occupied by the spinal column, and moulded the contour of the body; pinching up the head at one end, the tail at the other, and fashioning flank and limb into due salamandrine proportions, in so artistic a way that, after watching the process hour by hour, one is almost involuntarily possessed by the notion that some more subtle aid to vision than an achromatic glass would show the hidden artist, with his plan before him, striving with skillful manipulation to perfect his work.

"As life advances, and the young amphibian ranges the waters, the terror of his insect contemporaries, not only are nutritious particles supplied by its prey, by the addition of which to its frame growth takes place,

laid down, each in its proper spot, and in such due proportion to the rest, as to reproduce the form, the color, and the size characteristic of the parental stock; but even the wonderful powers of reproducing lost parts possessed by these animals are controlled by the same governing tendency. Cut off the legs, the tail, the jaws—separately or all together—and, as Spallanzani showed long ago, these parts not only grow again, but the redisintegrated limb is formed on the same type as those which were lost. The new jaw or leg is a newt's, and never by any accident more like that of a frog. What is true of the newt is true of every animal and plant; the acorn tends to build itself up again into a woodland giant such as that from whose twig it fell; the spore of the humblest lichen reproduces the green or brown incrustation which gave it birth; and at the other end of the scale of life, the child that resembled neither the paternal nor the maternal side of the house would be regarded as a kind of monster. So that the one end to which, in all living beings, the formative impulse is tending—the one scheme which the Archæus of the old speculators strives to carry out—seems to be to mould the offspring into the likeness of the parent. It is the first great law of reproduction that the offspring tends to resemble its parent or parents more closely than anything else."—(*Westminster Review* and *Ibid.*)

"*Are the Nerves Excitors or Controllers?*—Owing to the excessive complexity of the vital mechanism, our ingenuity is severely taxed in every attempt to arrive at the precise function of each organ in its relation to others. The observation which to-day seems conclusive, may become dubious to-morrow, and rejected the day after, when more accurate experiments reveal the source of fallacy. This being so, we hear with little surprise that the most brilliant physiologist of the day, Claude Bernard, has been led to doubt the truth of what has been considered indubitable ever since the nervous system has been systematically investigated, namely, that nerves are *excitors*, their functions being to excite the activity of the muscles and glands to which they are distributed. His words are these: 'May it not be, that we have formed false ideas relative to the influence of nerves in provoking the activity of organs? Instead of being excitors, nerves are only bridles; the organs, whose functional power is in some sort idio-organic, can only manifest that power at the moment when the nervous influence is suspended.' It is certain that a perfectly quiescent muscle is thrown into activity by a stimulus applied to its nerve. M. Bernard, perhaps, means his remarks to refer only to glands, since he makes no mention of the activity of muscles."—(*Ibid.*)

Electricity in Asphyxia. By CHAS KIDD, M.D., etc.—"Faradization cures facial hemiplegia, and renews the activity of paralyzed muscle, paralyzed for a time, for instance, by 'clot in the brain.' But the ordinary galvanic battery shock, like lightning, it is to be feared, runs back to the brain and aggravates the mischief, so that the former is much preferable to the latter. The ordinary magneto-electric conductors are at once the best and easiest managed, not only here but in accidents from drowning. A patient, given up as entirely dead, and remaining apparently so for over an hour after drowning and immersion for fifteen minutes, has been quite restored at the end of two hours' action of this battery. The present case is important, as the only one of a like kind perhaps yet treated in the same manner in our London hospitals, though four other cases

nearly similar and as effectual have been communicated to the author as occurring in general practice. Two cases of apnœa from drowning thus rescued and three from chloroform in all.

"The patient was a poor lady, otherwise in excellent health, (as it is to be remarked nearly all those chloroform accident patients are,) admitted into one of the pay wards of a hospital for a plastic operation on the vesico-vaginal septum, (operations, we may say, in passing, that owe a large part of their success to chloroform and the perfect stillness it induces,) there was slight hæmorrhage, and the author, who watched the pulse all through, was alarmed at its stopping once or twice and then going on again, till finally it was noticed that respiration also had stopped, with all the usual signs of apnœa.

"The woman was exactly in that state of suspended animation—pronounced dead, in fact—so difficult to describe in words without saying she was entirely dead. She was cold and white, her face like marble, devoid of expression, the falling jaw and insensible eye telling of some sudden accident; she lay as if dead, without pulse or respiration in the smallest degree, quite like some of the lower animals when poisoned by chloroform. Theory suggested if we can in this emergency establish only respiration, the *remora*, or stand-still of the circulation in the heart, will yield also, and pulse return. The Marshall Hall and Silvester methods were tried without effect; still there was no pulse, not the least sign of breathing, no animation. Dreadfully alarmed, the magneto-electric battery was sent for by the author, and applied as just directed; the effect was magical. Some confusion at first arose; twenty or thirty surgeons standing round had all different ideas how to apply it, but nearly all direct to the heart. The handles of the battery or poles were not insulated, the sponges dry. A German physician standing by happily caught the metallic handles by his coat-tails, (as non-conductors;) this saved the patient's life, as previously the handles could not be applied without giving the 'shock' to the person applying them rather than the patient.

"There was positively not the slightest sign of respiration in the patient for some time, till at the first moment of wetting the sponges and applying the insulated handles to the phrenic in the neck and diaphragm respectively, *a long, deep, sighing respiration was produced.*

"Off and on the insulated handles were now applied about a dozen times a minute, and at each application there was a deep moaning respiration.

"The patient still lay cold and white, her face unchanged, except in the moment of these forced respirations, which seemed half mechanical, direct from a spasm of the diaphragm. The insensible eye, the absence of pulse, all creating still much alarm. The author's pin out of his scarf was next stuck boldly into the diaphragm; the application of the electricity continued. It is necessary to give these details, as in a somewhat analogous case in America the same hasty means were adopted for nearly an hour before the patient showed signs of life. The author has also seen at Guy's Hospital electricity tried without any good result; but it was applied directly to the heart by some young students.

"Finally, it may be said, the pulse gradually returned in this case, as these artificial respirations by the electricity were continued, and the woman was perfectly restored; but not till after a couple of hours was it thought right to discontinue the use of the machine; indeed the nurse, seeing its good effect, sent hastily for the machine an hour after the pa-

tient was restored and sent back to her ward from the operating table. The woman finally left the hospital well, and did not remember anything of the operation or the electricity.

"The object in all such cases seems to be, by an intermittent but gentle current, (more like magnetism almost than galvanism,) to restore vital force to the muscles, by far the best kind of artificial respiration. Electricity fell into disrepute in chloroform accidents because it was applied to the heart; the author has seen it so applied in hospitals. The only method that is of any use being not to the heart but away from it, to the phrenic nerve and respiratory muscles, where this nerve in the neck lies at the crossing of the omo-hyoid up the outer edge of the sterno-mastoid muscle. The wetted sponge of one pole applied there, and the other sponge under the floating ribs, or in contact with an acupuncture needle plunged at once into the diaphragm. We need scarcely repeat that this remedy is rather of a complex nature; it has been made little of in the journalism of the day; but the tendency of all experiments with chloroform in animals tend in this direction.

"Whatever is done in such accidents must be done quickly; the face, and neck, and chest must be well exposed, artificial respiration by the Silvester plan tried.* Sometimes, by rudely turning a patient upside down, more blood gets to the brain, and respiration is set up; but it is now abundantly proved that where all the usual modes of resuscitation fail, the electro-magnetic current will restore life, and through its marvelous action on the respiratory nerves and muscles, rather than, as formerly taught, on the heart."—(*Dub. Med. Press.*)

Anæsthesia prolonged by Morphia.—"The Versailles Medical Society has been continuing its interesting researches (*Med. Times and Gaz.*, March 5) upon the subcutaneous injection of morphia during anæsthesia produced by chloroform. The animals submitted to the simultaneous action of the two agents have always exhibited a duration of insensibility proportionate to the quantity of morphia injected. In the last experiment performed, five centigrammes of morphia being employed, complete insensibility continued during three hours. The same dose injected, without chloroform having been employed, produced for a few minutes complete torpor and insensibility; but at the end of this time sensibility to pain returned completely. The conclusions from the whole series of experiments are—1. That salts of morphia, in doses of from five to ten centigrammes, injected alone produce a kind of intoxication which may go on to torpor, but do not give rise to insensibility, properly so called. The effect is not durable, and in a few minutes the animal returns to its normal condition. 2. Salts of morphia injected during anæsthesia produced by chloroform possess the singular property of prolonging the duration of the anæsthesia in proportion to the amount of morphia employed. 3. That this property may be turned to use without danger in man when the duration of an operation gives rise to fears of continuing the anæsthesia by means of chloroform."—(*Med. Times and Gaz.*)

"*Preservation of Chloroform.*—It requires but a short time for chloroform which is exposed to the sun's rays to undergo decomposition, hydrochloric acid being developed, and a strong odor of chlorine being

* Nitrous oxide should, if possible, be always administered in such cases.—Z.

present. This is prevented if the chloroform is kept in the dark; and when it has undergone decomposition by exposure, M. Boettger finds that it may be easily purified by shaking it up with a few fragments of caustic soda. As long, indeed, as it is in contact with the caustic soda it may be preserved for an indefinite period in diffused light."—(*Bull. de Thérap.* and *Ibid.*)

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"*Neuralgic Affections following Injuries of Nerves.* By J. Mason Warren, M.D., Surgeon to the Massachusetts General Hospital. *Amer. Journ. of Med. Sci.*, April.—The rational treatment of these affections, Dr. Warren regards as based on the fact that their natural tendency is to recover, if we can keep the patient comfortable during the time necessary for recovery to take place, either by division of the nerve, or by the general or local use of narcotics, of which the hypodermic injections of morphia have the preference. He reports several cases occurring in his practice, in which the injury seemed to have been in the tissues surrounding the nervous trunk rather than the trunk itself. In one of these cases the nerve was firmly glued to the surrounding tissues. These adhesions being separated, perfect relief from pain followed, which, however, returned in a diminished degree when cicatrization again commenced. The pain was then controlled for six months by the daily use of hypodermic injections of morphia. Other cases illustrate the powerful effect of these injections, not only in relieving the pain, but in actually curing it."—(*Amer. Med. Times.*)

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"*Binocular Microscope.*—The binocular microscope is fast growing into favor with the microscopists of New York and the vicinity, it being pretty generally conceded that it is much superior to the ordinary single-tubed instrument. The stereoscopic effect which it is enabled to produce is truly wonderful, even with high powers. We have seen with one of Mr. Grunow's instruments the human blood-globules having that degree of projection as to appear actually tangible. The edges were rounded out to that extent that we could almost see behind them."—(*Ibid.*)

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"*Treatment of Abscess by Chlorine Water.*—M. Hervieux recommends injections of chlorine water in the treatment of chronic abscess. In 1858, while acting for M. Noel Gueneau de Mussy at the Pitié Hospital, he had under his care a man who had a deep fistulous opening in the groin, which had resisted all kinds of treatment, and to which, for several months, nothing but simple dressing had been applied. M. Hervieux employed injections of chlorine water, varying the strength according to the state of the parts, and in less than a week the fistula was perfectly healed. In a very obstinate case of large axillary abscess lately under his care, he has employed the same means, with the results of rapidly producing contraction of the cavity and improving the health of the patient, a young woman aged twenty."—(*Bull. Gén. de Thér.* and *Canada Lancet.*)

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Treatment of Gangrene.—"Labarraque's chlorinated soda solution has proved quite efficient, applied in its full strength, as an arrester of gangrene. In all cases where the liquid could be thoroughly applied to the whole of the affected parts, one, or at most three or four applications, appeared to eradicate the disease. But it could not always be applied to deep-seated parts, or within sulci, without its becoming diluted with the

fluids already there, and such a quantity of the solution seemed to be demanded that it was liable to flow beyond the ulcer, and the healthy skin be blistered by it. In all cases of ulceration where no gangrene remains, we wash the surface once or twice a day with this solution diluted, and saturate the dressings with it as often as they get dry, or once in two hours, and are well pleased with the result."*—(DR. C. H. CLEAVELAND, *Chicago Med. Jour.*)

Oxygenesis.—"MR. ROBINS, the analytical chemist, has just discovered an easy way of obtaining oxygen. It simply consists in heating chromate of potash and peroxide of barium with diluted sulphuric acid. The operation is performed in a common glass retort, at the ordinary temperature. Now that oxygen is becoming a valuable therapeutic agent, this method of obtaining it will be found far more preferable to the old one, which consists in heating peroxide of manganese in iron retorts"—(*Cincinnati Lancet and Obs.*)

"*Anæsthetics.*—DR. GEORGES has addressed a note to the French Academy detailing various experiments. He states that a purified keresolene, obtained from petroleum oil, is a good anæsthetic, but requires the aid of heat. Brom-hydric ether he especially recommends as safer than chloroform, not easily inflamed, and having an exquisite odor."—(*Intellectual Observer.*)

"*Palates of Mollusca.*—MR. T. W. WONFOR obligingly sends the following: 'If you have not heard from any other source of a simpler method of obtaining the palates of mollusca than that mentioned in the Rev. E. Rowe's paper, I would call your attention to a plan suggested by Mr. Hennah. I have tried it, and found it very simple and successful. It is to boil the head of the mollusk in liquor potassæ in a test tube, by which means all parts, with the exception of the palate, are destroyed. The palate may now be taken out, washed in distilled water, and mounted. Those who have tried the dissection of minute mollusca will find this a saving of time and patience. It is better to boil the potassæ in a hot-water bath.'"—(*Ibid.*)

Caribe.—"DON RAMON PAEZ, in his recent work, '*Life in the Llanos, Venezuela, S. A.*,' states that some of the Venezuelian rivers are infested with a peculiarly ferocious and blood-thirsty fish known as the *caribe*, which, though not larger than a perch, is one of the most formidable creatures that man or beast can have the misfortune to encounter. Their sharp, triangular teeth, arranged in the same manner as those of the shark, are so strong, that neither copper, steel, nor twine can withstand them, and hence the angler stands no chance of sport where the *caribe* is found. 'The sight of any red substance,' says Don Ramon, 'blood especially, seems to rouse their sanguinary appetite; and as they usually go in swarms, it is extremely dangerous for man or beast to enter the water with even a scratch upon their bodies. Horses wounded with the spur are particularly exposed to their attacks, and so rapid is the work of destruction, that unless immediate assistance is rendered, the fish soon penetrate the abdomen of the animal, and speedily reduce it to a skeleton.' This cannibal fish is as

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* We have obtained excellent results in the treatment of gangrene from equal parts of the solution of chlorinated soda and tar water, to which creosote and other compatible agents may sometimes be added with advantage.—Z.

beautiful in aspect as it is fierce in nature. 'Large spots of a brilliant orange hue cover a great portion of its body, especially the belly, fins, and tail. Toward the back, it is of a bluish-ash color, with a slight tint of olive-green, the intermediate spaces being of a pearly white, while the gill-covers are tinged with red.' This fish, however, suffers from a special and constantly recurring visitation; being subject to a yearly mortality during the heat of summer when the water is deprived of a portion of the air it holds in solution. 'Their carcasses,' says Don Ramon, 'may then be seen floating on the water by thousands, while the beach is strewn with their bones, especially their bristling jaws, which render walking barefoot on the borders of lagoons extremely dangerous.'"—(*Ann. of Sci. Disc.*)

Tempering Steel.—"MR. ANDERSON, Assistant Superintendent of Woolwich Arsenal, announces the discovery of a simple process by which steel is rendered as tough as wrought-iron without losing its hardness. This change is effected in a few minutes by heating the metal and plunging it in oil, after which the steel can be bent, but scarcely broken. The value of this discovery will be at once appreciated by those who are aware of the difficulties hitherto experienced in obtaining a suitable material for the interior tubes of built-up guns."—(*Ibid.*)

Aniline for Coloring Vulcanite.—DR. GIBBONS says (*San Francisco Med. Press*) he has been informed by an intelligent dentist that experiments are in progress to determine the practicability of substituting aniline for red sulphuret of mercury in coloring vulcanite.

"*Action of Red Phosphorus on Sulphur.*—In a note to the Academy of Sciences, M. LEMOINE gives an account of some compounds of the two elements. The author found that when these two bodies reacted on each other they produced a compound having the formula P_2S_3. This compound is invariably produced, whatever the proportions employed may be. It is a very stable body, not oxidizing in the air, which crystallizes in the right rhombic prismatic system, boils and distils between 300° and 400° C., and dissolves in sulphide of carbon and chloride of phosphorus, from which latter solution water separates it unaltered. Alcohol and ether dissolve, but, at the same time, decompose it. It is perfectly soluble in the sulphides of potassium and sodium. Caustic potash dissolves it even in the cold, disengaging a mixture of hydrogen and phosphuretted hydrogen. Assisted by heat, the reaction produces sulphide of potassium and phosphite of potash. We ought to say that the author produced the compound by heating the two constituents together, and then separated it by means of sulphide of carbon, in which, as we have said, it easily dissolves."—(*Chem. News.*)

On Crucibles. By MR. JOHN C. BROUGH, of England.—"Crucibles have been in use for melting and refining metals from that distant point of time when man exchanged his stone hatchet and bone chisel for implements of bronze. The earliest melting-pots were doubtless made of the plastic and infusible substance—clay; and there is no reason to suppose that they differed essentially from the earthen crucibles now commonly used in our founderies.

"As an instrument of scientific research, the crucible has held an important position for at least a thousand years. It was constantly used

by the first alchemists, and may, indeed, be truly styled the cradle of experimental chemistry. The word 'crucible,' from the Latin *crux—crucis*, recalls the alchemical practice of marking the vessel with the protective sign of the cross.

"At the present time crucibles of one form or another are extensively employed by the refiner of gold and silver, the brass-founder, the melters of copper, zinc, and malleable iron, the manufacturer of cast-steel, the assayer, and the practical chemist. They are made in many different shapes and sizes, and of many materials, according to the purposes for which they are intended. For certain chemical experiments requiring high temperature, vessels of platinum, porcelain, and lime are adopted; but for ordinary metallurgical operations, 'clay crucibles' and 'plumbago crucibles' are exclusively employed. We have now to confine our remarks to these two important classes of crucibles.

"On examining a clay or plumbago crucible we find nothing to excite our surprise. It seems to be merely a rough specimen of pottery that might be easily imitated. Yet the successful makers of crucibles are so few that they might almost be counted on the fingers of two hands. When we take into consideration the qualities which are required in a crucible to enable it to pass victoriously through the ordeal by fire, the paucity of good makers becomes intelligible. The crucible should resist a high temperature without fusing or softening in a sensible degree; it should not be liable to break or crumble when grasped with the tongs; and it ought to be but little affected by the chemical action of the ashes of the fuel. Again, it may be required to withstand the corrosion and permeation of such matters as melted oxide of lead. In some cases crucibles should resist very sudden and great alternations of temperature, so that they may be plunged while cold into a furnace nearly white-hot without cracking. In other cases they are merely required to resist a high temperature after having been gradually heated. Some crucibles are specially remarkable for one quality and others for another, so that in selecting them the conditions to which they will be exposed must be kept in view. The crucibles which present the finest combination of good qualities are those from which the Patent Plumbago Crucible Company takes its name. They support, even when of the largest size, the greatest and most sudden alternations of temperature without cracking; they can be used repeatedly, and their inner surface can be made so smooth that there is no fear of the particles of metal hanging about their sides. Their first cost is necessarily high, as plumbago is an expensive raw material; but the fact that they may be used for a great number of meltings makes them in reality cheaper than the ordinary clay pots. As fire-clay contracts considerably when exposed to a high temperature, it cannot be used alone for large crucibles. The so-called 'clay crucibles' are made of a mixture of the plastic clay and some other substance, such as highly-burnt fire-clay, silica or coke, which counteracts in a measure the evil due to contraction, and so lessens the tendency of the vessels to crack. The large Stourbridge clay crucibles, so extensively employed by the brass-founders of Birmingham, contain both burnt clay and coke. The Cornish and Hessian crucibles are made of peculiar kinds of clay in admixture with sand. The great superiority of the plumbago crucibles over these can be easily accounted for by the fact that graphite or plumbago is the most infusible of all substances known, and at the same time a material that can be thoroughly incorporated with the clay without impairing its plasticity."(—*Sci. Amer.*)